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PREFACE.

ALTHOUGH the number of works on Natural History might deter any writer from venturing on so extensively handled a subject, there is at present no work of a really popular character in which accuracy of information and systematic arrangement are united with brevity and simplicity of treatment.

The present volume is but a brief digest of a large mass of materials, derived either from personal experience, from the most recent zoological writers, or from the kindness of many friends, who are familiar with almost every portion of the world, and to whom my best thanks are due.

I dismiss these pages with almost a feeling of regret, that a task which has to me been a labor of love, has come to an end. Indeed, the only drawback experienced during its progress was its necessary brevity, which constrained me to omit many creatures, not only beautiful and wonderful in form, but interesting in habits. I was also compelled to describe many others so briefly as to render the account little more than a formal announcement of their name, country, and food. In compressing the subject into a smaller compass I have concentrated the language without excluding any necessary information.



HEAD OF THE PREHISTORIC MAN (restored).

The above head is drawn on the basis of the skull found in 1857 at Neanderthal, near Düsseldorf, in Germany, and supposed to be the cranium of a prehistoric man. It is dolichocephalic and almost without a brow.

NATURAL HISTORY.

QUADRUMANA.

THIS section includes the apes, baboons and monkeys. The name Quadrumana is given to these animals because, in addition to two hands like those of man, their feet are also formed like hands, and are capable of grasping the branches among which most monkeys pass their lives. Apes are placed at the head because their instinct is superior to that of the baboons and monkeys. Baboons are usually sullen and ferocious when arrived at their full growth, and monkeys are volatile and mischievous.

The first in order, as well as the largest of the apes, is the enormous ape from Western Africa, the **GORILLA**. The first writer to bring the Gorilla before the notice of the public seems to be Mr. Bowdich, the African traveller; for it is evidently of the Gorilla that he speaks under the name of Ingheena. The natives of the Gaboon and its vicinity use the name Gina when mentioning the Gorilla. The tales told of the habits, the gigantic strength, and the general appearance of the Ingheena, are precisely those which are attributed to the Gorilla.

Such a deed as the capture of an adult Gorilla has never been attempted, much less achieved, by the human inhabitants of the same land. There are many reasons for this circumstance. In the first place, the negroes, seeing that the Gorilla is possessed of gigantic strength, conceive that the animal must be inspirited by the soul of one of their kings; for in the lower stages of man's progress he

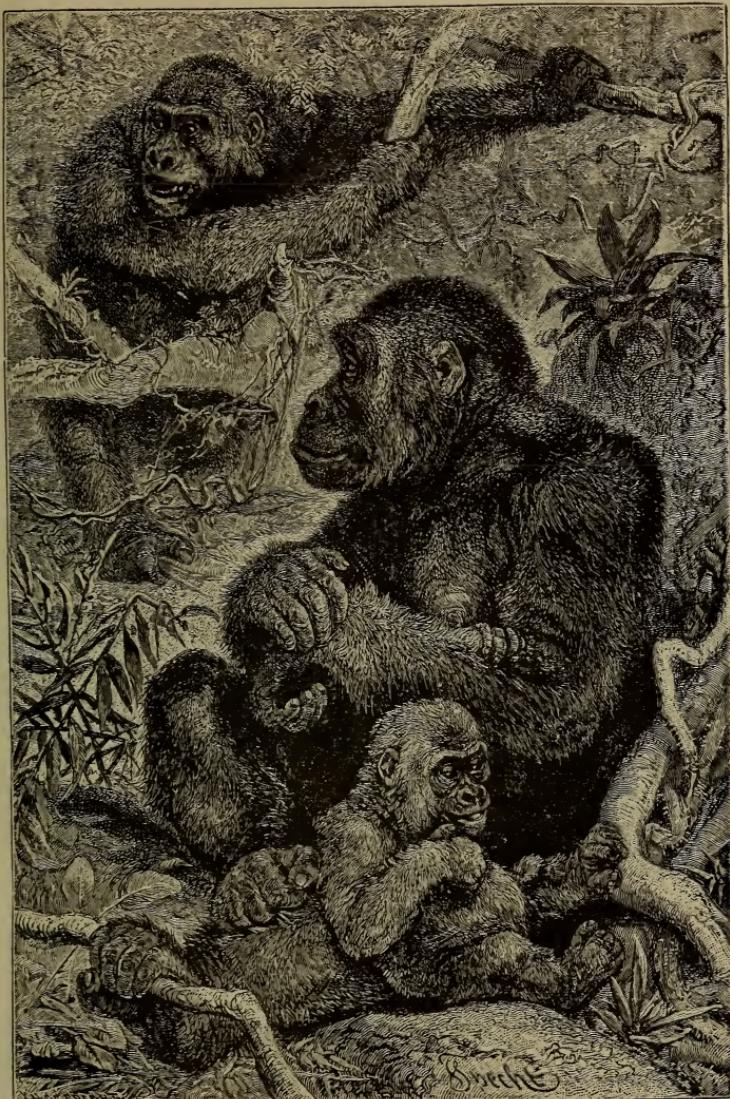
does honor to physical force alone, and values his ruler in proportion to his power, brutality and heartlessness.

The task of capturing a living and full-grown Gorilla is well calculated to appall the heart of any man. The strength, the activity and the cunning of the animal are so great, that the uncivilized Africans may well be excused for their dread of its powers.

The outline of the Gorilla's face is most brutal in character, and entirely destroys the slight resemblance to the human countenance which the full form exhibits. As in the chimpanzee, an ape which is placed in the same genus with the Gorilla, the color of the hair is nearly black; but in some lights, and during the life of the animal, it assumes a lighter tinge of grayish brown, on account of the admixture of variously colored hairs. On the top of the head, and the side of the cheeks, it assumes a grizzly hue. The length of the hair is not very great, considering the size of the animal, and is not more than three inches in length.

As to the habits of the Gorilla, many conflicting tales have been told. In order to settle the disputed questions, Mr. Winwoode Reade undertook a journey to Africa, where he remained for a considerable time. After careful investigation he sums up the history of the animal as follows:

"The ordinary cry of the Gorilla is of a plaintive character, but in rage it is a sharp, hoarse bark, not unlike the roar of a tiger. The negroes' account of the ape's ferocity scarcely bears out those afforded by Drs. Savage and Ford. They deny that the Gorilla ever attacks man without provocation. 'Leave Njina alone,' they say, 'and Njina leave you alone.' But when the Gorilla, surprised while feeding or asleep, is suddenly brought to bay, he goes round in a kind of half-circle, keeping his eyes fixed on the man, and uttering a complaining, uneasy cry. If the hunter shoots at him, and the gun misses fire, or if the ape is wounded, he will sometimes run away; sometimes,



GORILLAS AT HOME.

however, he will charge, with his fierce look, his lowered lip, his hair falling on his brow. He does not, however, appear to be very agile, for the hunters frequently escape from him.

“ His charge is made on all-fours ; he seizes the offensive object, and dragging it into his mouth, bites it. The story of his crushing a musket-barrel between his teeth is general, and a French officer told me that a gun was exhibited at the French settlements in the Gaboon, twisted ‘ *comme une papillote*. ’ I heard a great deal about men being killed by Gorillas, but wherever I went I found that the story retreated to tradition. That a man might be killed by a Gorilla I do not affect to doubt for a moment, but that a man has not been killed by one within the memory of the living I can most firmly assert.

“ I once saw a man who had been wounded by a Gorilla. It was a Mohaga hunter, who piloted me in the forests of Ngumbi. His left hand was completely crippled, and the marks of teeth were visible on the wrist. I asked him to show me exactly how the Gorilla attacked him. I was to be the hunter, he the Gorilla. I pretended to shoot at him. He rushed towards me on all-fours, and seizing my wrist with one of his hands, dragged it to his mouth, bit it, and then made off. So, he said, the Njina had done to him. It is by these simple tests that one can best arrive at truth among the negroes. That which I can attest from my own personal experience in my unsuccessful attempts to shoot a Gorilla is as follows : I have seen the nests of the Gorillas. I cannot say positively whether they are used as beds, or only as lying-in couches. I have repeatedly seen the tracks of the Gorillas, and could tell by the tracks that the Gorilla goes habitually on all-fours.

“ I have never seen the tracks of so many as two Gorillas in company. I have seen a young Gorilla and a young chimpanzee in a domestic state. They were equally docile. I have seen the dung of the Gorilla, which resembles

that of a man; and I can say positively that the Gorilla sometimes runs away from man, for I have been near enough to hear one run away from me. I heard that sometimes a family of Gorillas will ascend a tree and will



CHIMPANZEE.

eat a certain fruit till they become gorged, like turkey-buzzards. The old father remains seated at the foot of the tree. If you can approach close enough to shoot him, you may then kill the rest of the family at your ease. The second story is the one so often told, not only of Go-

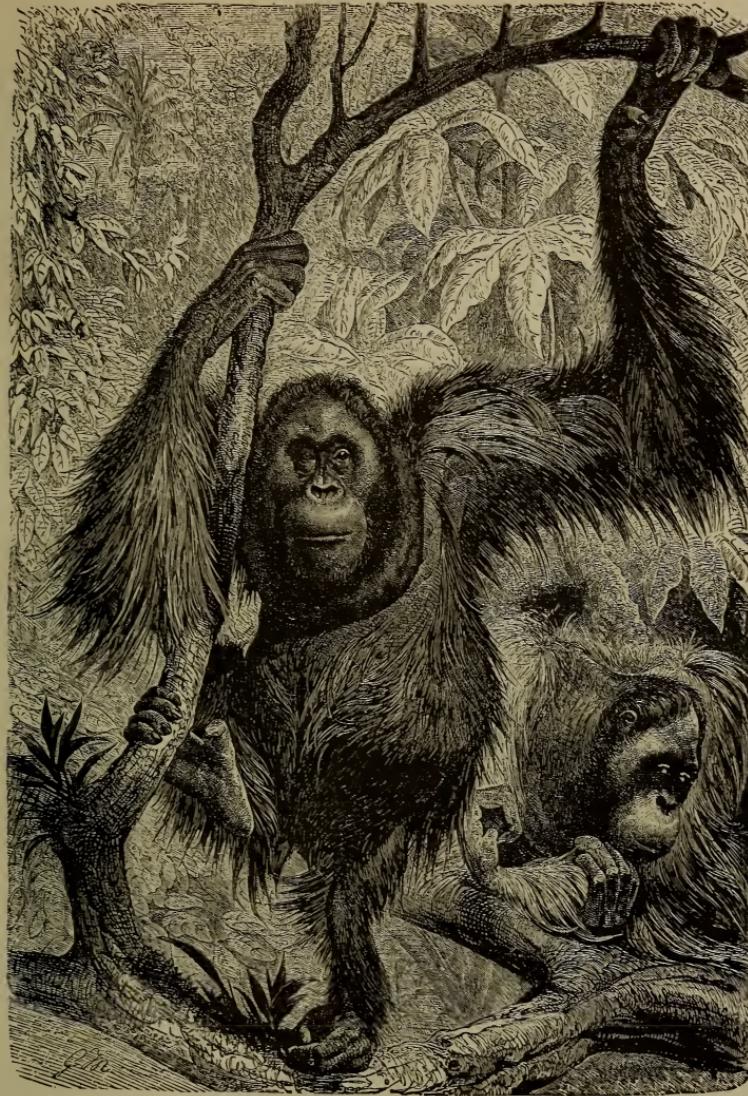
rillas but of all large monkeys—of women being run away with. At a village on the right-hand bank of the Fernand Vaz, the women are said to have been frequently chased by Gorillas as they went to fill their calabashes at the spring. A woman was brought to me who stated that she herself had excited the passion of a Gorilla and had hardly escaped him. In all this, however, there is nothing wonderful. We know that monkeys are susceptible animals. But when one hears of a woman being carried off to the woods, and living among apes in a semi-domesticated state, we are justified in thorough disbelief.

The CHIMPANZEE is a native of Western Africa. Large bands congregate together and unite in repelling an invader, which they do with such fury and courage that even the elephant and lion are driven from their haunts by their united efforts. They live principally on the ground, and spend much of their time in caves and under rocks. Their height is from four to five feet. They do not reach this growth until ten years of age.

Several young Chimpanzees that have been captured have shown themselves very docile and gentle.

The ORANG-OUTAN inhabits Borneo and Sumatra. This is the largest of all the apes, as it is said they have been obtained above five feet in height. The strength of this animal is tremendous. Its arms are of extraordinary length, the hands reaching the ground when it stands erect. This length of arm is admirably adapted for climbing trees, on which it principally resides. The following account is given of the Orangs of Borneo:

“The Orangs are dull and slothful, and on no occasion, when pursuing them, did they move so fast as to preclude my keeping pace with them easily enough through a moderately clear forest; and even when obstructions below (such as wading up to the neck) allowed them to get away some distance, they were sure to stop and allow us to come up. I never observed any attempt at defense;



ORANGS IN THEIR NATIVE WOODS.

and the wood, which rattled about our ears, was broken by their weight, and not thrown, as some persons represent. If pushed to extremity, however, they are formidable; and one unfortunate man, who was trying to catch one alive, lost two of his fingers, besides being severely bitten on the face, while the animal finally beat off his pursuers and escaped. When they wish to catch an adult they cut down a circle of trees round the one on which he is seated, and then fell that also, and close before he can recover himself, and endeavor to bind him.

“The rude hut which they build in the trees would be more properly called a seat, or nest, for it has no roof or cover of any sort. The facility with which they form this seat is curious. I saw a wounded female weave the branches together and seat herself in a minute. She afterwards received our fire without moving, and expired in her lofty abode, whence it cost us much trouble to dislodge her.”

The great difference between the kassar and the pappan (as the natives name them) in size proves the distinction of the two species; the kassar being a small slight animal, by no means formidable in his appearance, with hands and feet proportioned to the body, and they do not approach the gigantic extremities of the pappan either in size or power; a moderately strong man would readily overpower one, when he would not stand a chance with the pappan.

I saw a young Orang. It had a very small and very rotund body, to which were affixed very long and slender limbs. Its face was like that of an old miser, thoroughly wearied of life, and contemplating surrounding objects with a calm but derisive pity.

It possessed in a high degree the expressive mobile character of the lips, which appeared to express its feelings much in the same manner as do the ears of a horse. When it was alarmed or astonished at any object it was

accustomed to shoot out both its lips, and to form its mouth into a trumpet kind of shape. A snail would make him produce this contortion of countenance.

The creature was very tame, and delighted in walking about the garden leaning on the arm of its keeper, and if any lady would venture to be its guide, it appeared exceedingly happy.

When young the Orang is very docile, and has been taught to make its own bed, and to handle a cup and saucer, or a spoon, with tolerable propriety. It not only laid its own bedclothes smooth and comfortable, but exhibited much ingenuity in stealing blankets from other beds, which it added to its own. A young Orang evinced extreme horror at the sight of a small tortoise, and, when the reptile was placed in its den, stood aghast in a terrified attitude, with its eyes intently fixed on the frightful object.

The AGILE GIBBON is a native of Sumatra. It derives its name of Agile from the wonderful activity it displays in launching itself through the air from branch to branch. One of these creatures sprang with the greatest ease through a distance of eighteen feet; and when apples or nuts were thrown to her while in the air, she would catch them without discontinuing her course. She kept up a succession of springs, hardly touching the branches in her progress, continually uttering a musical but almost deafening cry. She was very tame and gentle, and would permit herself to be caressed. The height of the Gibbon is about three feet, and the reach of the extended arms about six feet. There are several species of Gibbon.

The KAHAU, a native of Borneo, derives its name from the cry it utters, which is a repetition of the word "Kahau." It is remarkable for the size and shape of its nose, and while leaping it holds that organ with its paws, apparently to guard it against the branches.

Its length, from the head to the tip of the tail, is a little

over four feet, and its general color is a sandy red, relieved by yellow cheeks and a yellow stripe over the shoulders.

BABOONS are distinguished from the apes by their short tails. The MANDRILL, the most conspicuous of the tribe, is a native of Guinea and Western Africa, and is chiefly remarkable for the vivid colors with which it is adorned. Its checks are of a brilliant blue, its muzzle of a bright scarlet, and a stripe of crimson runs along the center of its nose. These colors are agreeably contrasted by the purple hues of the hinder quarters. It lives in forests filled with brushwood, from which it makes incursions into the nearest villages, plundering them with impunity. On this account it is much dreaded by the natives, who feel themselves incapable of resisting its attacks. It is excessively ferocious, and easily excited to anger.

The greenish-brown color of the hair of this and other monkeys is caused by the alternate bands of yellow and black, which exist on each hair. The brilliant colors referred to above belong to the skin, and fade away entirely after death, becoming paler when the animal is not in perfect health.

The AMERICAN MONKEYS are found exclusively in South America, and are never seen north of Panama. Their tails are invariably long, and, in some genera, prehensile.

The COAITA is one of the Spider Monkeys, so called from their long, slender limbs, and their method of progressing among the branches. The tail seems to answer the purpose of a fifth hand, as it is capable of being used for every purpose to which the hand could be applied; indeed, the Spider Monkeys are said to use this member for hooking out objects where a hand could not be inserted. The tail is of use in climbing among the branches of trees: they coil it round the boughs to lower or raise themselves, and often will suspend themselves entirely by it, and then by a more powerful impetus swing off to some distant branch. The habits of all the Spider Mon-

keys are very similar. They are sensitive to cold, and when chilly wrap their tails about them, so that this useful organ answers the purpose of a boa as well as a hand.



BABOON.

They will also, when shot, fasten their tails so firmly on the branches that they remain suspended after death. The great length of their tails enables them to walk in the erect attitude better than most monkeys. In walking they cast their tails upwards as high as the shoulders, and then

bend them over so as to form a counterbalance against the weight of the body, which is thrown very much forward in that and most other monkeys. The genus is called *Ateles*, or imperfect, because in most of the species the thumb is wanting. The Coaita inhabits Surinam and Guinea.

The HOWLING MONKEYS are larger and not so agile as the Spider Monkeys, and are chiefly remarkable for the peculiarity from which they derive their name. They possess an enlargement in the throat, composed of several valvular pouches, which apparatus renders their cry loud and mournful. They howl in concert at the rising and setting of the sun; one monkey begins the cry, which is taken up by the rest, precisely as may be observed in a colony of rooks. They are in great request among the natives as articles of food, their slow habits rendering them an easy prey.

The Ursine Howler is common in Brazil, where fifty have been seen on one tree. They travel in files, an old monkey taking the lead, and the others following in due order. They feed principally on leaves and fruit; the tail is prehensile.

The MARMOSET is a most interesting little creature. It is very sensitive to cold, and when in America is usually occupied in nestling among the materials for its bed, which it heaps up in one corner, and out of which it seldom entirely emerges. It will eat almost any article of food, but is fond of insects. It will also eat fruits. Its fondness for insects has been carried so far, that it has been known to pinch out the figures of beetles in entomological work, and swallow them.

This little Monkey is also called the Oquistiti, from its peculiar whistling cry when alarmed or provoked.

The LEMURS derive their name from their nocturnal habits and their noiseless movements. The Ruffled Lemur is a native of Madagascar. It lives in the depths of

the forests, and only moves by night, the entire day being spent in sleep. Its food consists of fruits, insects and



MARMOSETS.

small birds, which latter it takes while they are sleeping. This is the largest of the Lemurs, being rather larger than a cat.

The SLENDER LORIS is a native of India, Ceylon, etc.

Like the Lemur, it seldom moves by day, but prowls about at night in search of food. No sooner does it spy a sleeping bird than it slowly advances until within reach ; then putting forward its paw with a motion slow and imperceptible as the movement of the shadow on the dial, it gradually places its fingers over the devoted bird ; then, with a movement swifter than the eye can follow, it seizes its startled prey.

BATS: WING-HANDED ANIMALS.

WE now arrive at the BATS. The usual food of Bats is insects, which they mostly capture on the wing, but some, as the Vampires, suck blood from other animals, and a few, as the Kalong, or Flying Fox, live upon fruits, and so devastate the mango crops that the natives are forced to cover them with bamboo baskets. Even the cocoa-nut is not secure from their depredations.

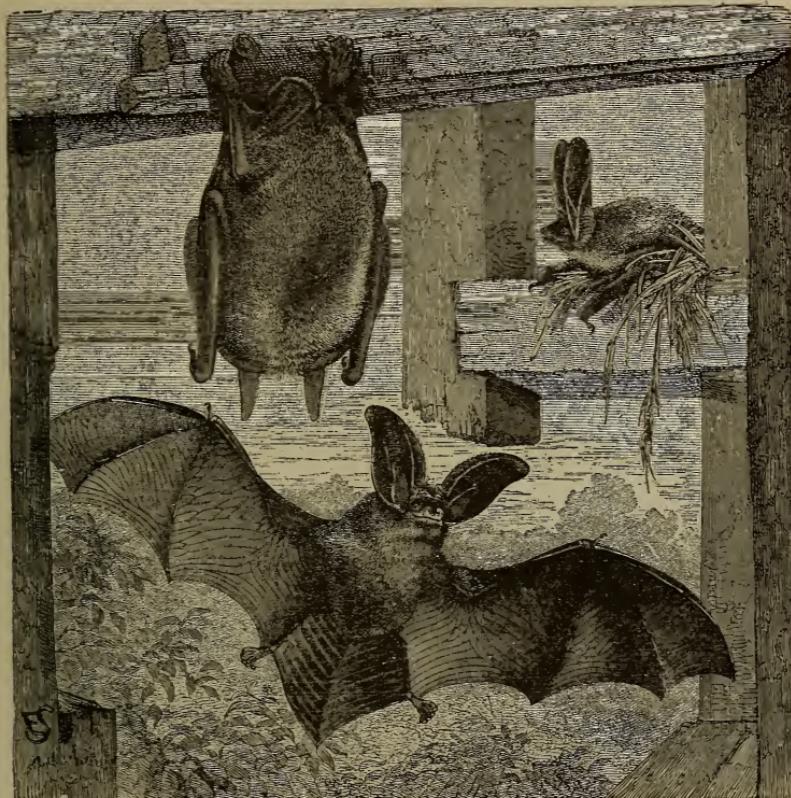
The membrane of the Bat's wing is plentifully supplied with nerves, and is extremely sensitive, almost appearing to supply a sense independent of sight. Many Bats possess a similar membrane on the nose, which is possibly used for the same purpose.

The object of the elongation of the finger-joints is to give the animal the power of extending the wing membrane or folding it at pleasure. The thumb-joint has no part of the wing attached to it, but is left free, and is armed with a hook at the extremity, by means of which it is enabled to drag itself along in that singular vacillating hobble which constitutes a Bat's walk.

There are five sub families of Bats, according to Gray, each tribe including many genera. The British Museum alone possesses eighty genera.

The Vampire Bat is a native of South America, where it is very common, and held in some dread. It lives on the blood of animals, and sucks usually while its victim

sleeps. The extremities, where the blood flows freely, as the toe of a man, the ears of a horse, or the combs and wattles of fowls, are its favorite spots. When it has selected



THE LONG-EARED BAT.

a subject on which it intends to feed, it watches until the animal is fairly asleep. It then carefully fans its victim with its wings while it bites a little hole in the ear or

shoulder, and through this small aperture, into which a pin's head would scarcely pass, it contrives to abstract sufficient blood to make a very ample meal. The wound is so small, and the Bat manages so adroitly, that the victim does not discover that anything has happened until the morning, when blood betrays the visit of the Vampire.

The wound made by the bat's teeth is no larger than that made by a needle, and hardly penetrates the skin, so that the blood must be extracted by suction. There have been very different accounts of the Vampires from travelers, some denying that they suck blood at all, and others narrating circumstantially the injuries inflicted upon their own persons. The cause for these discrepancies is due to the constitution of the narrators, there being some persons whom a Vampire will not touch, while others are constantly victimized. The length of its body is six inches.

The LONG-EARED BAT is found in most parts of Europe. It may be seen any warm evening flying about in search of insects, and uttering its peculiar shrill cry. The ears are about an inch and a half in length, and have a fold in them reaching almost to the lips.

This Bat is very easily tamed, and will take flies and other insects from the hand.

When the Long-eared Bat is suspended by its hinder claws, it assumes a most singular aspect. The beautiful long ears are tucked under its wings, which envelop great part of its body. The tragus, or pointed membrane visible inside the ear, is then exposed, and appears to be the actual ear itself, giving the creature a totally different cast of character.

QUADRUPEDS.

THE former sections have been characterized by the number and properties of the *hands*. In this section the hands have been modified into feet. At the head of the quadrupeds, or four-footed animals, are placed the car-

nivora, or flesh-eaters, and at the head of the carnivora, the Felidæ, or cat kind are placed, as being the most perfect and beautiful in that section. The Felidæ all take their prey by creeping as near as they can without observation, and then springing upon their victim, which seldom succeeds in making its escape, as the powerful claws and teeth of its enemy usually dash it insensible to the ground. The jaws of the Felidæ are powerful, and their teeth long and sharp. Their claws are necessarily very long, curved and sharp, and to prevent them from being injured by coming into contact with the ground they are retracted, when not in use, into a sheath, which guards them and keeps them sharp. There are five claws on the fore-feet, and four on the hinder feet. The tongue is very rough, as may be proved by feeling the tongue of a cat. This roughness is occasioned by innumerable little hooks which cover the tongue, point backwards, and are used for the purpose of licking the flesh off the bones of their prey. The bristles of the mouth or whiskers are each connected with a large nerve, and are useful in indicating an obstacle when the animal prowls by night. Their eyes are adapted for nocturnal vision by the dilating power of the pupil, which expands so as to take in every ray of light.

The LION stands at the head of the wild beasts. His noble and dignified bearing, the terrific power compressed into his comparatively small frame, and the deep majesty of his voice, have gained for him the name of "king of beasts." The Lion inhabits Africa and certain parts of Arabia and Persia, and some parts of India. It varies in appearance according to the locality, but there is little doubt that there is but one species.

The roar of the Lion is one of its chief peculiarities; the best description of it is in Gordon Cumming's Adventures:

"One of the most striking things connected with the Lion is his voice, which is extremely grand and peculiarly

striking. It consists, at times, of a low, deep moaning, repeated five or six times, ending in faintly-audible sighs; at other times he startles the forest with loud, deep-toned, solemn roars, repeated five or six times in quick succession, each increasing in loudness to the third or fourth, when his voice dies away in five or six low, muffled sounds, very much resembling distant thunder. At times a troop may be heard roaring in concert, one assuming the lead, and two, three, or four more regularly taking up their parts, like persons singing a catch."

The opinion that Lions will not touch a dead animal is erroneous, as they were frequently shot by Gordon Cumming while devouring gnoos, etc., that had fallen by his rifle. Lions who have once tasted human flesh are most to be dreaded, as they will even venture to spring in among a company of men and seize their victim. They are called Man-eaters.

The Lioness is much smaller than the Lion, and is destitute of the mane which is so great an ornament to her mate. As a rule she is more fierce and active than the male, especially before she has had cubs, or while she is suckling them. She has usually from two to four cubs at a time. They are beautiful, playful little things, and are slightly striped. They have no mane until about two years old. While her cubs are small the Lioness knows no fear, and will attack a company of men, or a herd of oxen, if they come too near her den. The cubs are remarkably heavy for their age.

The Lion when young is easily tamed, and shows an attachment to its keeper. Those who have visited menageries will know what influence man may obtain over this powerful creature.

There is one remarkable difference in the characters of the feline and canine tribes. If a man is overcome by a wolf or dog, the animal mangles its foe until life is extinct. A dog killing a rat is a good instance of this trait of char-



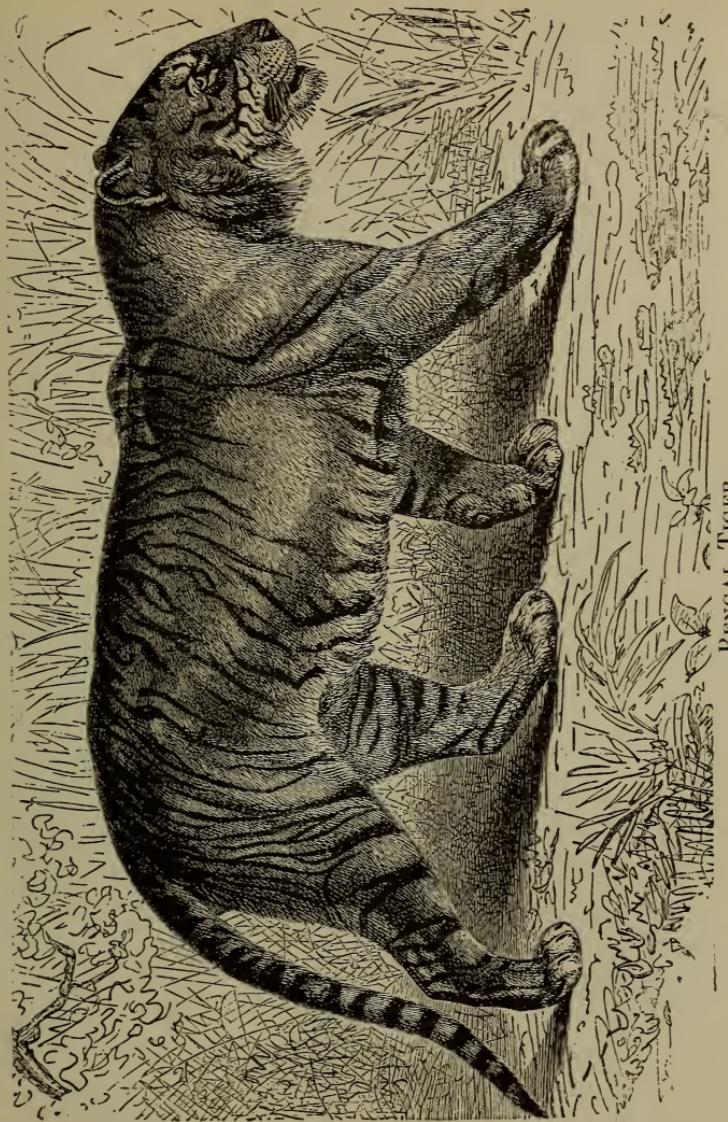
LION AND LIONESS.

acter. But if a lion or any other feline animal vanquishes a man it contents itself with the victory for some time without making any attempt to injure him, unless he tries to escape, in which case he is again dashed to the earth, and probably bitten as a warning. A cat treats a mouse as a lion treats a man.

This propensity in the Lion has been the cause of saving many lives, the men having been able either to destroy their foe by cautiously getting out a weapon, or by lying still until they were succored.

At the extremity of the Lion's tail there is a small hook or claw, which has been represented as the means by which the animal lashes itself into fury, using it as a spur. This is impossible, as the claw or prickle is very small, not fixed to the bone as the claws of the feet are, but merely attached to the skin, and falls off if roughly handled. It is not present in all lions.

The **TIGER** is a magnificent animal, found only in Asia, Hindostan being the part most infested by it. In size it is almost equal to the Lion, its height being nearly four feet, and its length rather more than eight feet. It has no mane, but is decorated with black stripes, upon a ground of reddish-yellow fur, which becomes almost white on the under parts of the body. The chase of the Tiger is a favorite sport in India. The hunters assemble, mounted on elephants trained to the sport, and carry with them a supply of loaded rifles in their carriages mounted on the elephants' backs. Thus armed, they proceed to the spot where a tiger has been seen. The animal is usually found hidden in the long grass or jungle, which is frequently eight or more feet in height, and when roused it endeavors to creep away under the grass. The movement of the leaves betrays him, and he is checked by a rifle-ball aimed at him through the jungle. Finding that he cannot escape without being seen, he turns round and springs at the nearest elephant, endeavoring to clamber up it and attack the party. This



BENGAL TIGER.

is the dangerous part of the proceedings, as many elephants will turn round and run away, despite the efforts of their drivers to make them face the Tiger. Should the elephant stand firm a well-directed ball checks the tiger in his spring, and he then endeavors again to escape, but a volley of rifle-balls from the backs of the other elephants, who by this time have come up, lays the savage animal prostrate, and in a very short time his skin decorates the successful marksman's carriage.

Tigers are usually taken in pitfalls at the bottom of which is planted a bamboo stake, the top of which is sharpened into a point. The animal falls on the point, and is impaled. Tigers can be tamed as easily as the lion; but great caution must be used with all wild animals, as in a moment of irritation their savage nature breaks out, and the consequences have more than once proved fatal.

The coloring of the tiger is a good instance of the manner in which animals are protected by the similarity of their external appearance to the particular locality in which they reside. The stripes on the tiger's skin so exactly resemble the long jungle-grass among which it lives that it is impossible for unpracticed eyes to discern the animal at all, even when the body is exposed.

The LEOPARD is an inhabitant of Africa, India and the Indian Islands. A black variety inhabits Java, and is not uncommon there. Its height is about two feet. This and the following Felidæ are accustomed to live much on trees, and are on that account called Tree-tigers by the natives. Nothing can be more beautiful than the elegant and active manner in which the Leopards sport among the branches of the trees: at one time they will bound from branch to branch with such rapidity that the eye can scarcely follow them; then, as if tired, they will suddenly stretch themselves along a branch, so as to be hardly distinguishable from the bark, but start up again on the slightest provoca-

THE LEOPARD.



tion, and again resume their graceful antics. It is easily tamed, and expresses great fondness for its keeper, and will play with him like a cat.

It is fond of some scents, especially preferring lavender water, by means of which predilection it has been taught to perform several tricks.

The Leopard and Panther are considered as the same animal.

The JAGUAR inhabits America. It is larger and more powerful than the leopard, which it resembles in color, but has a black streak across the chest, and a black spot in the center of the rosettes. It is fond of climbing trees, and finds little difficulty in ascending, even when the trunk is smooth and destitute of branches. It chases monkeys successfully, and is said to watch for turtles on the beach, and to scoop out their flesh by turning them on their backs and inserting its paws between the shells. Nor does it confine its attention to the turtles themselves, for it watches them lay their eggs and then scoops them out of the sand with its claws. It makes havoc among the sheepfolds, and is said to depart so far from the usual habits of the Felidæ as to enter the water after fish, and to capture them in the shallows by striking them out of the water with a blow of its paw. The domestic cat has been seen to act in the same manner.

When it captures one of the larger animals it destroys it by leaping upon its back and twisting the head of its prey round until the neck is dislocated.

The PUMA is found throughout South America and a great part of North America. It is known in Spanish American countries as the American lion, and in the United States as the catamount or wild-cat, and vulgarly as "painter" (a corruption of "panther"). The adult male is about five feet long, has a thick fur, brown above and grayish-white beneath, with the ears and tail nearly black, and sometimes partially striped along the sides. It

climbs trees and usually lies along the branches, where its uniform dusky fur renders it so like the bark that it can scarcely be distinguished from the branch. It lives



THE PUMA.

chiefly upon deer, and has a shrill scream; is cowardly, and does not voluntarily attack man, but makes a desperate resistance to the hunter. It is easily tamed, and becomes quite docile.

The OCELOT, one of the Tiger-cats, is a native of Mexico and Peru. Its height is about eighteen inches, and its length about three feet. It is a beautiful animal, and easily tamed. When in a wild state it lives principally on monkeys, which it takes by stratagem.

The domestic CAT was formerly supposed to be the same animal as the Wild Cat, but it is now proved to be a distinct species, and the difference is seen at once by the form of the tail. That of the domestic Cat is long and taper, while that of the wild cat is bushy and short.

The Cat is known to us as a persevering mouse-hunter. So strong is the passion for hunting in the breast of the Cat that she has been known to chase hares.

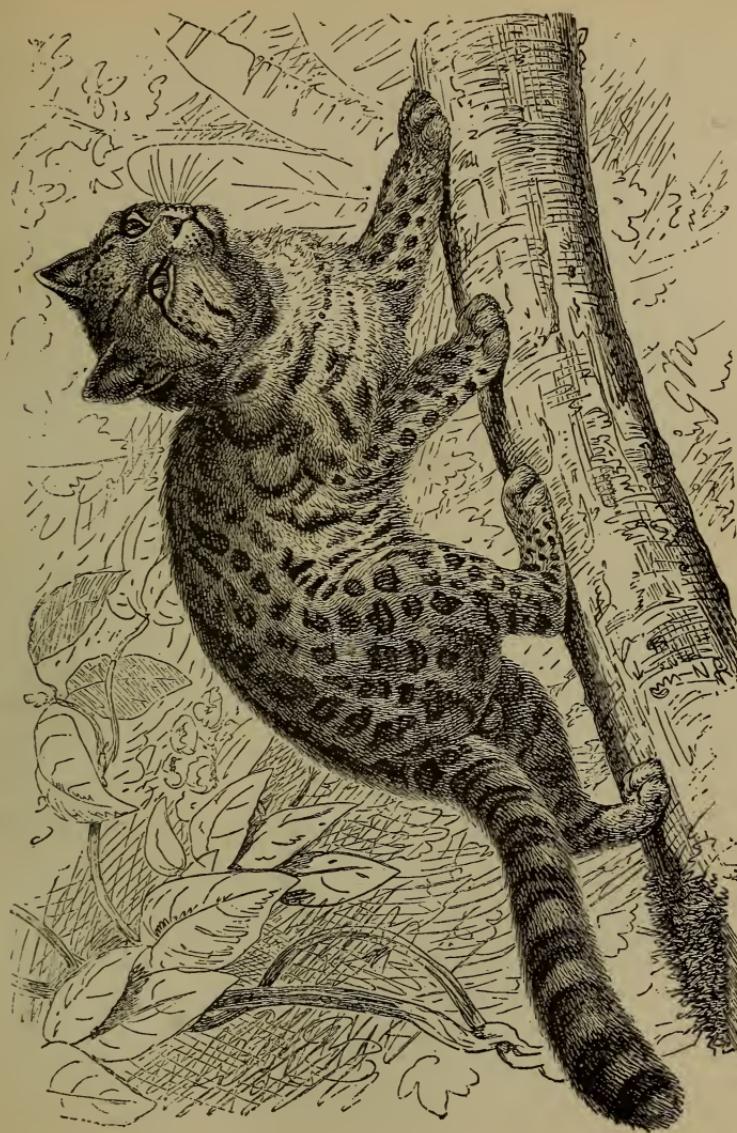
This instinctive desire of hunting seems to be implanted in cats at a very early age. I have seen kittens, but just able to see, bristle up at the touch of a mouse, and growl in a terrific manner if disturbed.

The Cat displays great affection for her kittens, and her pride when they first run about is amusing.

Cats are very fond of aromatic plants. My own cat has just been discovered in the act of eating the green tops of a musk-plant that was standing in the window. Valerian appears to be the great attraction for cats, and where it is planted cats will come in numbers, roll over it, and scratch up the plant until there is not a vestige of it left.

There are several varieties of the domestic cat, among which the Angora Cats, with their beautiful long fur, and the Manx Cats, which have no tails, are the most conspicuous.

The LYNXES are remarkable for the pencil of hairs which tufts their sharply pointed ears. The Canada Lynx is remarkable for its gait. Its method of progression is by bounds from all four feet at once, with the back arched. It feeds principally on hares, as it lacks courage to attack the larger quadrupeds. Its length is about three feet. The Indians sometimes eat its flesh, which is white and



WILD CAT.

firm, and not unlike that of the hare. Its skin forms an article of commerce.

The CHETAH, or HUNTING LEOPARD, as it is sometimes called, is one of the most elegant and graceful animals known. It is a native both of Africa and India, but it is only in the latter country that it is used for hunting game. The method of employing it is as follows: The Chetah is usually blindfolded and placed upon a cart, and taken as near as possible to the place where deer are feeding. When close enough, the hunter takes the band from its eyes and directs its head towards the game. Directly the Chetah sees the deer it creeps off the cart and makes towards them as rapidly and silently as it can, carefully availing itself of the cover of a bush or stone, precisely as a cat does when stealing after a bird. When it has succeeded in approaching the unsuspecting herd, it makes two or three tremendous springs and fastens on the back of one unfortunate deer brings it to the ground, and waits until its keeper comes up, who induces it to leave its prey by a ladlefull of blood, which he takes care to have ready. The Chetah is then hooded and led back to his cart. It is so easily tamable and so gentle that it is frequently led for sale about the streets by a string.

It is larger than the leopard, and differs from it in the length of its paws, its inability to climb trees, and the crispness of its fur. It is therefore placed in a different genus from the leopard.

HYENAS are remarkable for their predatory, ferocious and cowardly habits. There are several Hyenas, the striped, the spotted and the villoose, but as the habits of all are very similar only one will be mentioned. The hyenas, although very repulsive in appearance, are yet very useful, as they prowl in search of dead animals, and will devour them even when putrid, so that they act the same part among beasts that the vultures do among birds, and are equally uninviting in aspect. They not infrequently



ANGORA CAT.

dig up recently-interred corpses. Their jaws and teeth are exceedingly powerful, as they can crush the thigh-bone of an ox with little effort, and so great is the strain upon the bones by the exertions of these muscles that the vertebræ of the neck become ankylosed, that is, become united together, and the animal has a perpetual stiff neck in consequence. The skull, too, is very strong, and furnished with heavy ridges for the support of the muscles which move the jaw.

Its hinder parts are very small, and give it a strange shambling appearance when walking. It is easily tamed, and even domesticated.

The striped Hyena is found in many parts of Asia and Africa, where it is both a benefit and a pest, for when dead animals fail it the flocks and herds are ravaged, and even man does not always escape.

The CIVETS are active little animals, averaging about two feet in length. The whole group is celebrated for the perfume which is secreted in a glandular pouch near the tail, and is of some importance in commerce.

The Civet is only found in North Africa, especially in Abyssinia, where it takes up its abode on uncultivated and barren hills. It feeds upon birds and the smaller quadrupeds, which it takes by surprise.

The ICHNEUMONS, or MANGOUSTS, well deserve their name of Creepers, for with their long bodies and snouts, their short limbs and slender tails, they insinuate themselves into every crevice in their way in search of their expected food. Few animals are more useful than the Ichneumons. Snakes, lizards, crocodiles' eggs, or even young crocodiles themselves, form their principal food, and their activity is so great that, when these sources fail, they are able to secure birds, and even seize upon the swift and wary lizards, which, when alarmed, dart off like streaks of green light glancing through the bushes.

THE NORTHERN LYNX.



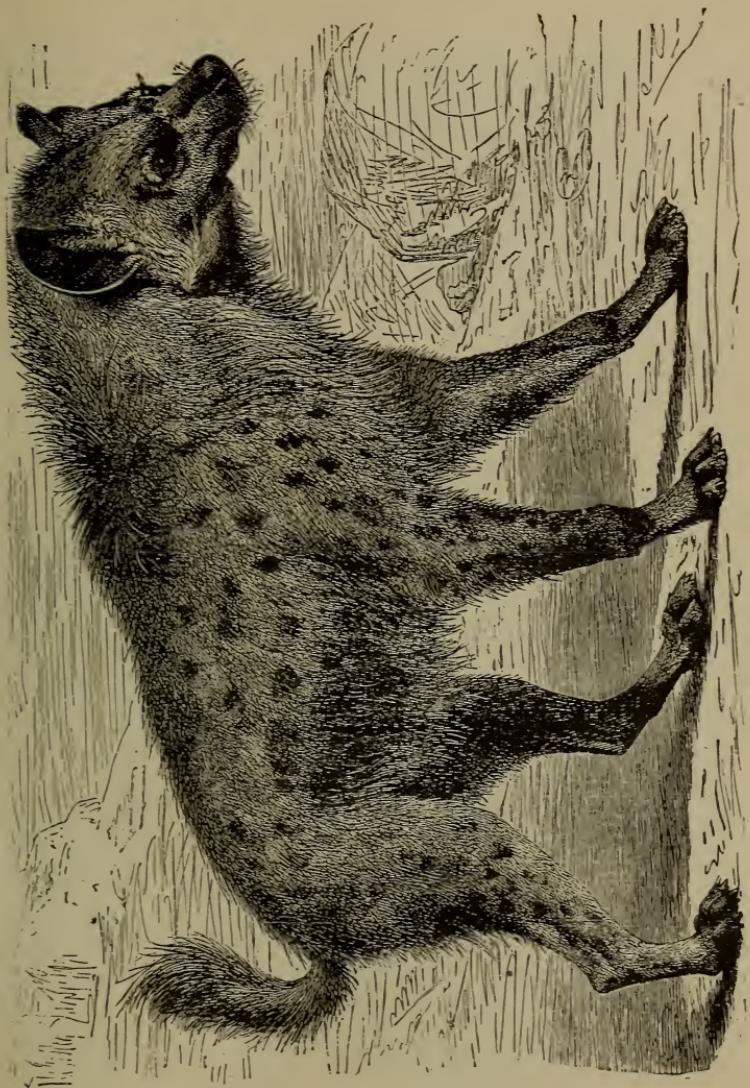
The Egyptian Ichneumon, or Pharaoh's Rat, as it is sometimes called, is a native of North Africa, and is often domesticated for the purpose of destroying the various snakes and other reptile annoyances which are such a pest in the houses of hot countries. Its length without the tail is about eighteen inches.

The DOG FAMILY includes Dogs, Wolves, Jackals and Foxes. The first of the Dogs is the Kolsun or Dhale, which inhabits Bombay and Nepaul. It hunts in packs, as most of the dogs do even in a wild state, and has been known to destroy tigers and chetahs. The NEWFOUNDLAND Dog is a magnificent creature, and was originally brought from Newfoundland. It is often confounded with the Labrador Dog, a larger and more powerful animal. Both these dogs are trained by their native masters to draw sledges and little carriages, and on that account are highly esteemed. The Newfoundland is well known as a faithful guardian of its master's property. It is fond of the water, and will fetch out any article that its master indicates and lay it at his feet. Many instances are known of this noble animal saving the lives of people that have fallen into the water, and must have perished but for its timely aid.

It is one of the largest of the dogs, standing nearly twenty-six inches in height.

The BLOODHOUND, of which there are several varieties, inhabits Cuba, Africa and England. They are all endowed with a wonderfully acute sense of smell, and can trace a man or animal with almost unerring certainty. The Cuban Bloodhound was employed by the Spaniards to hunt down the natives while endeavoring to escape from their invasions.

The FOXHOUND and BEAGLE are not very dissimilar in form or in habits. They both follow game by the scent, and are used in hunting. The Foxhound, as its name



SPOTTED HYENA.

implies, is used for hunting the fox, and enters into the sport with great eagerness. Its height is about twenty-two inches.

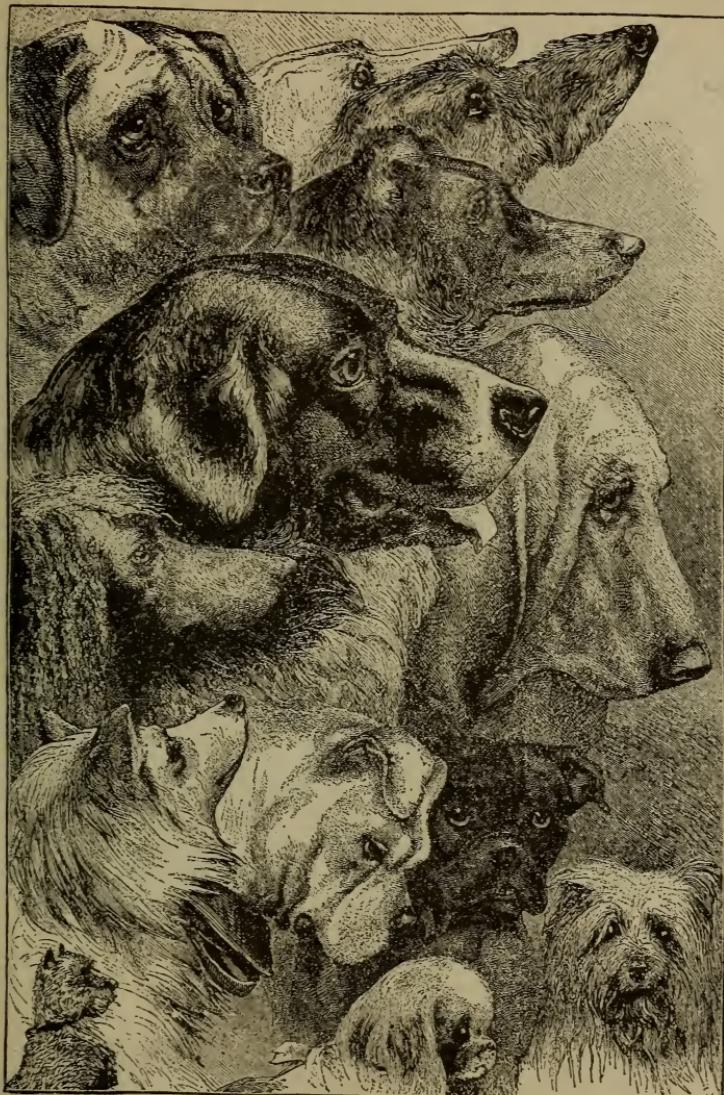
The BEAGLE is used principally for hare-hunting. It is much smaller than the Foxhound, and not nearly so swift, but its scent is so perfect that it follows every track of the flying hare, unravels all her windings, and seldom fails to secure her at last. Sportsmen usually prefer the smallest beagles obtainable. The most valuable pack of these dogs known used to be carried to and from the field in a pair of panniers slung across a horse's back. It is a common custom in the military schools, and at the universities, to follow the beagle on foot. There is a society near London who thus hunt on foot. As too much time would be lost in looking for a living hare, a dead rabbit is trailed along the ground, and as its fur has been rubbed with aniseed, the dogs can follow it easily.

The POINTER is used by sportsmen to point out the spot where the game lies. It ranges the fields until it scents the hare or partridge lying close on the ground. It then remains still, as if carved in stone, every limb fixed, and the tail pointing straight behind it. In this attitude it remains until the gun is discharged, reloaded, and the sportsman has reached the place where the bird sprang.

The MASTIFF is distinguished by the shortness of the nose and the breadth of the head. This group includes the mastiff, the bull-dog and the absurd little pug-dog. The breadth of their heads is caused by the large muscles which move the jaw.

The Mastiff is generally employed as a house-dog, as its powerful frame and deep voice are well fitted to scare away marauders or to repel them if they approach too near. It is the most sagacious of the whole group, and exhibits more attachment to its master than the others.

The BULL-DOG is proverbial for courage and endurance, but its social qualities are by no means pleasing. Al-



DOGS.

though it has some attachment for its master, yet it is not always safe even for him to disturb it. This dog was extensively used in the cruel sport of bull-baiting, a recreation now extinct. When opposed to the bull the dog would fly at its nose, and there hang in spite of all the infuriated animal's struggles.

The TERRIERS never grow to any considerable size. There are several breeds, the English and Scotch being the most conspicuous. These dogs are principally used for destroying rats or other vermin, and are so courageous that they do not hesitate to unearth the fox or the badger. Otters are also hunted by them, but prove by no means an easy prey. Terriers are extremely attached to their masters, and are capable of learning many tricks.

The SHEPHERD'S DOG is a rough, shaggy animal, with sharp-pointed ears and nose. It is an invaluable assistant, never suffering the sheep to stray, and when two flocks have mixed it will separate its own charge with the greatest certainty. It understands every look and gesture of its master, and drives the flock to any place which he points out.

The GREYHOUND is the swiftest of all dogs, and is principally used in the pursuit of the hare. It has but little delicacy of scent, and hunts almost entirely by sight. The hare endeavors to baffle it by making sharp turns, which the dog cannot do on account of its superior size, and has therefore to take a circuit, during which the hare makes off in another direction. The hare also has the property of stopping almost instantaneously when at full speed. It puts this manoeuvre into force when it is nearing its favorite hiding-place. It induces the dog to spring upon it, and then suddenly checks itself. The dog is carried twenty feet by its own momentum, and the hare springs to her place of refuge.

WOLF.—The Wolf looks much like a large, shaggy dog, and it has been thought by many that the first dogs

sprung from Wolves. When taken young the Wolf may be tamed, and it shows as much love for its master as the dog does. The Wolf is very swift, and hunts deer and



WOLF.

other animals in pairs. It is sly and stealthy, and often prowls about lonely farms to catch stray sheep, calves, pigs or fowls, but is also cowardly, and is easily frightened off by the barking of a dog or the sound of a gun. But

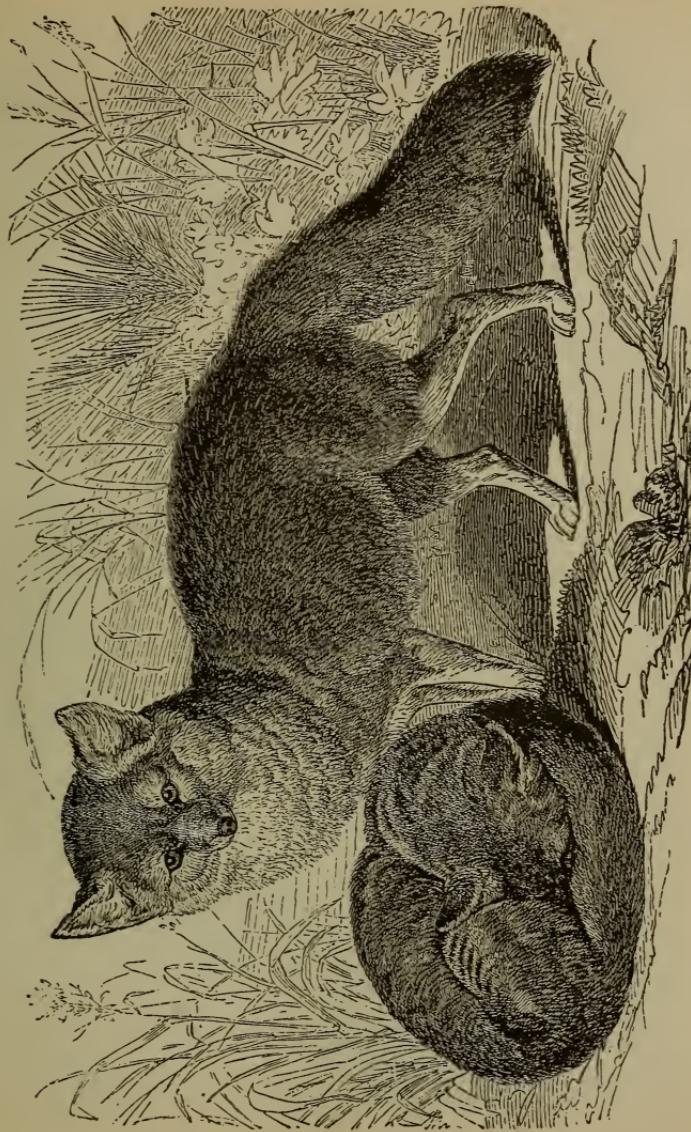
when pressed by hunger it becomes dangerous, and will attack horses and oxen, and even men. In hard winters packs of hungry Wolves come down from the forests of the Alps and other mountains in Europe and commit great ravages; and many terrible stories have been told of travellers who have been chased by them in great forests, especially in Russia and Siberia. In one case a man and his wife, who were riding in a sleigh through the woods, were so hard pressed by Wolves that they saved themselves only by throwing out their children, one by one, to be devoured by the hungry beasts. It is said that in Russia more than two hundred human beings are killed by Wolves every year, and a great many thousands of cattle and sheep.

The GRAY WOLF, of North America, is usually gray above and yellowish-gray below, but is sometimes nearly white. It is three or four feet long, with a tail about a foot and a half long. Packs of these Wolves follow the buffalo herds on the Western plains, feeding on the sick and straggling ones. They also attack horses, and sometimes men, when very hungry. They were once plentiful in New England, but now only a few are found in mountains and thickly-wooded parts.

The Indians catch many Gray Wolves in traps, and also kill many by surrounding them in a circle, which they make smaller, little by little, until they get near enough to shoot them.

The PRAIRIE WOLF, which the Mexicans call *Coyote*, is smaller than the Gray Wolf, and is much like the Jackal. The true Wolf has a howl like that of a dog, but the Prairie Wolf has only a kind of snapping bark, whence it is sometimes called the Barking Wolf. It lives in burrows on the great Western plains, is very swift, and hunts in packs.

The Fox, this terror of hen-roosts and delight of sportsmen, is found in many parts of America and many other



GRAY FOX.

countries. It varies very much in color and size, according to the country where it lives.

The habits of this animal are mostly nocturnal. It lies by day concealed in its burrow; but towards evening it sallies out in search of food, and woe to the hare, rabbit, pheasant or fowl that comes in its way!

Sometimes he steals into the hen-roost, destroys and carries off most of its inmates, some of which he devours on the spot, others he carries home, and the remainder he buries for a future repast.

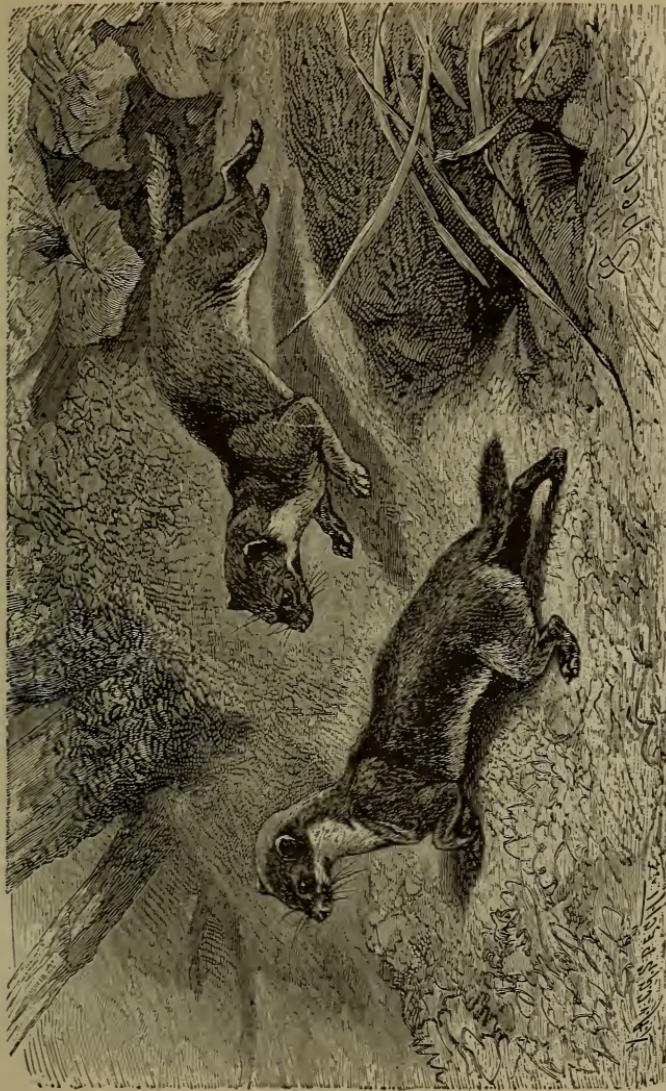
When irritated the Fox gives out a strong, disagreeable scent, which lies so long on the ground that it may be perceived for nearly an hour after the Fox has passed. Partly on this account, and partly on account of its speed, endurance and cunning, the chase of the Fox is a favorite sport.

WEASELS are easily distinguished by their long, slender bodies, short muzzle, sharp teeth and predatory habits. They inhabit almost every part of the world, and procure their food by creeping on the unsuspecting victim, generally a rabbit, rat or bird, and then suddenly darting at it and piercing its neck with their sharp teeth. Almost all the Weasels devour the brain and suck the blood of their prey, but seldom touch the flesh, unless they are pressed by hunger.

There are two kinds of MARTENS, named, from their favorite haunts, the Pine and the Beech Marten. The Pine is common in North America, where it is much too fond of chickens and ducklings to be a desirable neighbor. This animal, as well as the Sable, is much sought after on account of its skin, which furnishes a beautiful fur, not much inferior to that of the Sable.

The STOAT, or ERMINE, is another common animal. It is smaller than the polecat, but its habits are scarcely less predaceous. Hares and rabbits fall easy victims to their little enemy, who dispatches them with a single bite, pene-

THE WEASEL.



trating the brain. During the winter the Stoat becomes partially white, in northern countries wholly so, except the tip of the tail, which remains black. In this state it is called the Ermine, and is killed in great numbers for the sake of its valuable fur.

The WEASEL is the least of this tribe. It is very useful to farmers, as it wages war on rats and mice, and extirpates them from a barn or stack. It hunts by scent like dogs, and tracks the unfortunate rat with the most deadly certainty. It is a courageous little animal, and will even attack men, who have found it by no means a despicable antagonist, as its instinct invariably leads it to dash at the throat, where a bite from its long sharp teeth would be very dangerous.

The BADGER.—This harmless and much injured animal (which is often subjected to such ill-treatment that the term “badgering” a person is used to express irritating him in every possible way) lives at the bottom of deep burrows which it excavates, and in which it passes all the day, sleeping on a bed of hay and grass. When the evening approaches it seeks its food, consisting of roots, fruit, insects, and sometimes young rabbits. It is also said to attack the wild bee, and boldly to devour the honey-combs, its thick hair and skin rendering it utterly regardless of the stings of the enraged bees.

The power of the Badger’s bite is caused by the manner in which the under jaw is set on. Not only are its teeth sharp, and the leverage of its jaw powerful, but the jaw is so contrived that when the creature closes its mouth the jaws lock together as it were, and are held fast without much exertion on the part of the Badger.

Its skin is rather valuable, the hair being employed in the manufacture of brushes, and its fur being in some request for holsters. The length of the Badger is 27 inches.

The OTTER seems to play the same part in the water as the Polecat and the other weasels on the land. Like the



THE GRIZZLY BEAR.

(49)

Polecat it is rapacious, and destroys many more creatures than it can devour ; and as the Polecat only eats the brain and sucks the blood, so the Otter daintily eats the flakes at the back of the fish's neck and leaves the remainder for less fastidious animals.

It slides noiselessly into the water, turns and twists about below the surface with the same ease as a fish, then, with a graceful sweep of the body, it glides to the surface and ascends the bank with almost the same motion. While below the surface it bears a great resemblance to the seal, the method in which it disposes its hind-feet greatly assisting the effect. Its rapid and easy movements in the water are mostly performed by the assistance of its powerful tapering tail.

The Otter is easily tamed, and is sometimes trained to catch fish and bring them to shore.

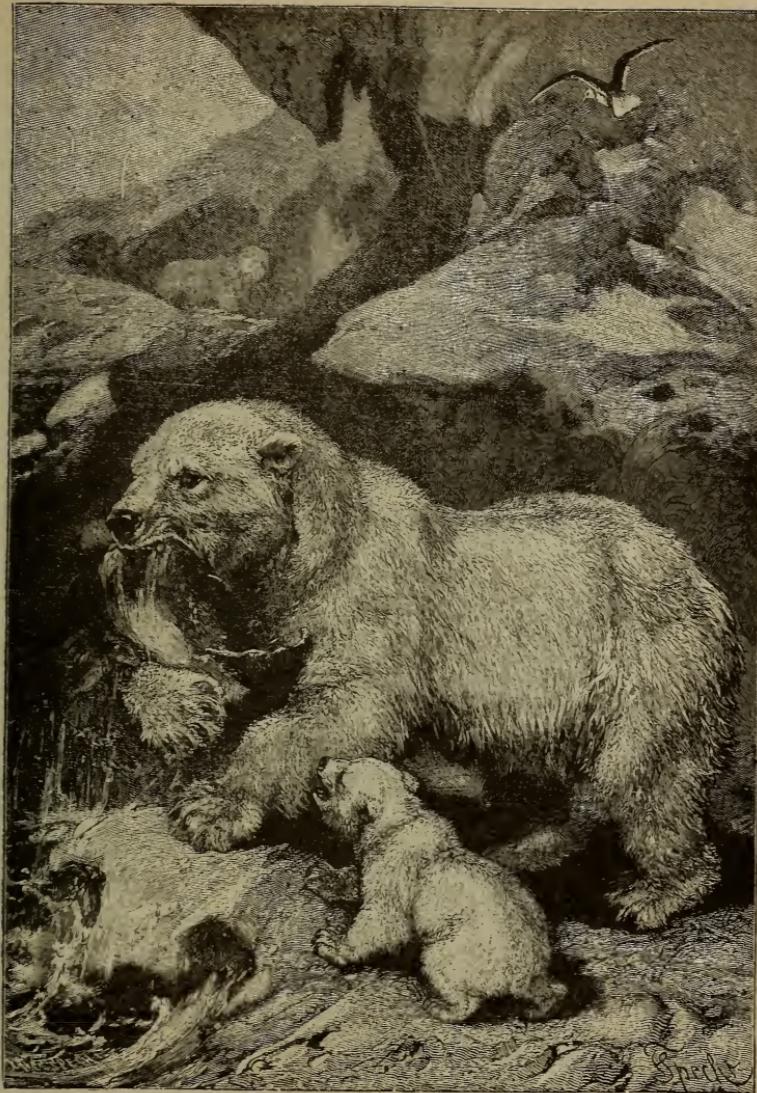
The Hindoos have brought the art of Otter-training to great perfection, and keep their Otters regularly tethered with ropes and straw collars on the banks of the river.

The BEARS and their allies are mostly heavy, and walk with the whole foot placed flat on the ground, unlike the cats, dogs, etc., who walk with merely their paws or toes. All the Bears eat either animal or vegetable food, so that a leg of mutton, a pot of honey, a potato or an apple are equally acceptable.

The BROWN BEAR inhabits the north of Europe, Switzerland and the Pyrenees. It is hunted with much skill, and taken in traps and pitfalls.

In the olden time the bear used to be baited, that is, tied to a pole, and several dogs were set at him, the object being to see whether the bear could bite the dogs or the dogs bite the bear with the greater force. This cruel sport is now extinct.

The GRIZZLY BEAR is a native of North America. It is the most ferocious and powerful of its family, and is an animal which must either be avoided or fought, for there



POLAR BEARS AND THEIR PREY.

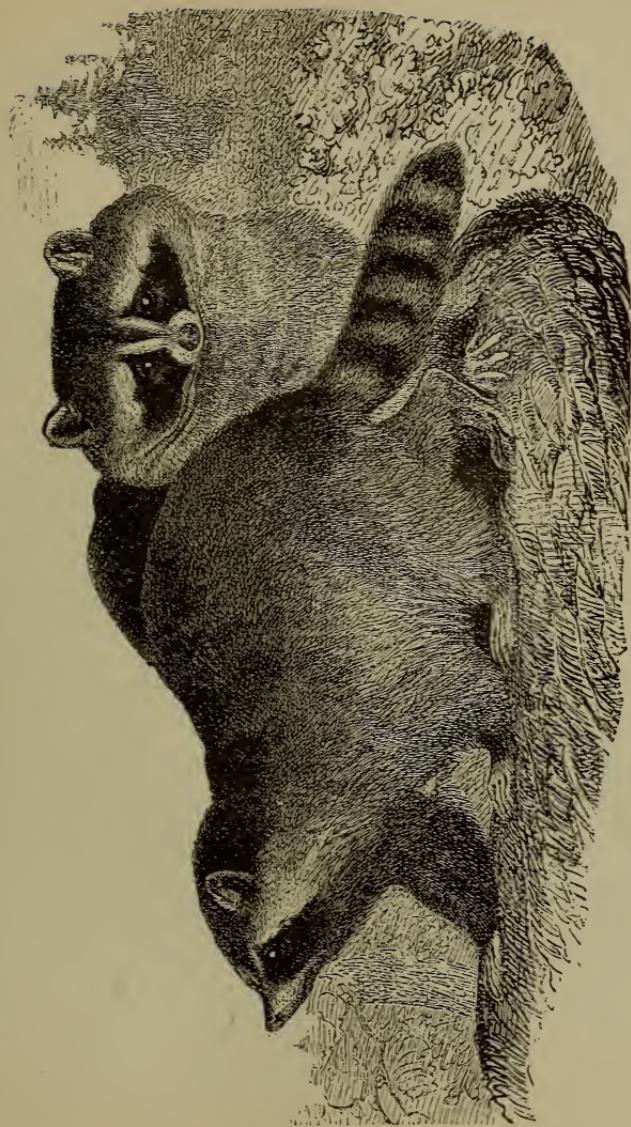
is no medium. If a Grizzly Bear once sees a man it will probably chase him, and will do so with great perseverance. A traveller relates that he had been chased nearly thirty miles by one of these Bears, who would probably have kept up the chase as many miles more had he not crossed a wide river, over which the Bear did not choose to follow him.

The Grizzly Bear is marvellously tenacious of life. It is said after a party of hunters have been combating one of these bears it is impossible to find four square inches of sound skin on the animal's body, a ball through the brain or heart affording the only means of safety to the hunter. It is rather singular that this Bear has the power of moving each claw separately, as we move our fingers. It is able to overcome and carry off the enormous bison, and to dig a pit in which to bury it.

The POLAR, or WHITE BEAR, called Nennook by the Esquimaux, lives in the Arctic regions, where it feeds on seals, fish, and even the walrus, but it dares not attack the latter animal openly. It is a formidable antagonist either by land or water, as it dives with great ease and is able to chase the seal amid the waves. As the seals frequently crawl out of the water upon rocks or fragments of ice, the Polar Bear is forced to swim after them; but lest they should observe him he makes his approaches by a succession of dives, and contrives that the last dive brings him directly under the unsuspecting seal, who is immediately grasped and killed. These Bears are often drifted from Greenland to Iceland on fields of ice, and they find the flocks and herds so very delicious after a long course of seal diet that the inhabitants are forced to rise in a body and put an end to their depredations.

To give this animal, who is constantly running over fields of ice, a firm footing the soles of its feet are thickly covered with long hair.

The Raccoon is an animal about the size of a large fox,



COMMON RACCOON.

and inhabits Canada and parts of America. It is said to wash its food before eating it. Its skin is valuable, and much sought after.

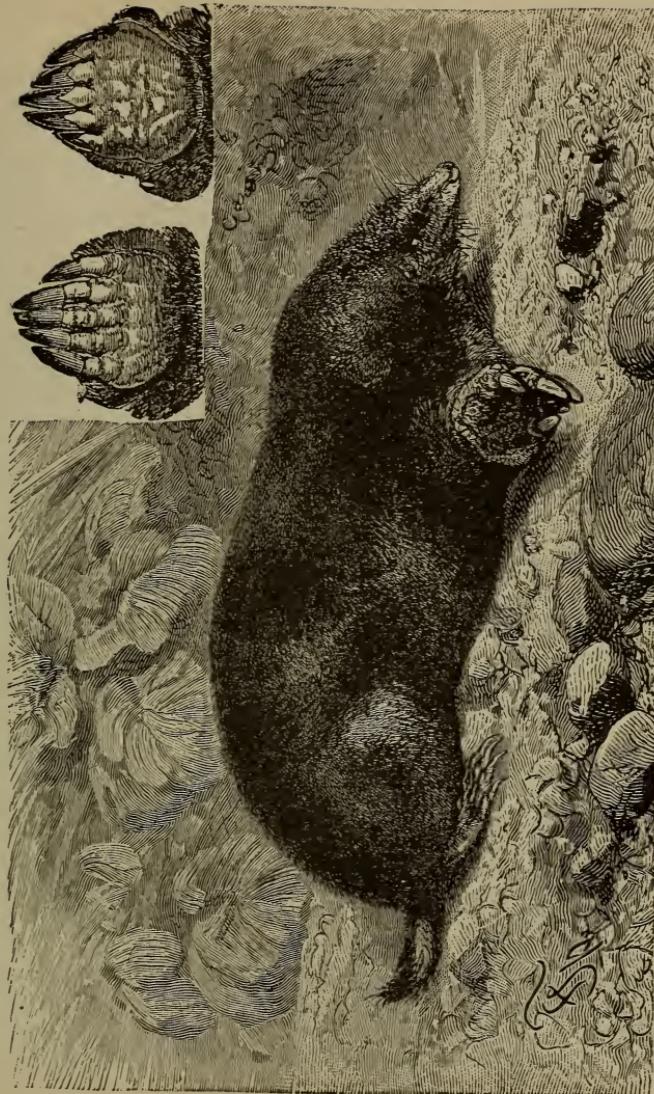
The food of the Raccoon is principally small animals and insects. Oysters are also a very favorite article of its diet. It bites off the hinge of the oyster and scrapes out the animal in fragments with its paws. Like a squirrel when eating a nut, the Raccoon usually holds its food between its fore-paws pressed together, and sits upon its hind-quarters while it eats. Poultry are favorite objects of its attack, and it is said to be as destructive in a farm-yard as any Fox, for it only devours the heads of the murdered fowl. Like the Fox, it prowls by night.

When taken young it is easily tamed, but very frequently becomes blind soon after its capture. This effect is supposed to be produced by the sensitive state of its eyes, which are only intended to be used by night; but as it is frequently awakened by daylight during its captivity, it suffers so much from the unusual glare, that its eyes gradually lose their sight.

Many ridiculous stories of the MOLE and its habits are told. It is said to be deprived of eyes, to undergo unheard-of tortures in forcing its way through the earth, and to spend a life of misery in damp and darkness. But so far from being a miserable animal, the Mole seems to enjoy its life quite as much as any other creature. It is beautifully fitted for the station which it fills, and would be unhappy if removed from its accustomed damp and darkness into warmth and light.

Its eyes are very small, in order to prevent them from being injured by the earth through which the animal makes its way; indeed, larger eyes would be useless underground. When, however, the Mole requires to use its eyes, it can bring them forward from the mass of fur which conceals and protects them when not in use. The acute ears and delicate sense of smell supply the place of

Upper and lower surface of right
fore-foot of Mole.



THE COMMON MOLE.

eyes. Its fur is very fine, soft, capable of turning in any direction, and will not retain a particle of mold. But the most extraordinary part of the Mole is the paw or hand with which it digs. The two fore-paws are composed of five fingers, armed with sharp, strong nails, in order to scrape up the earth; and to prevent the accumulated mold from impeding the mole's progress, the hands are turned outwardly, so as to throw the earth out of its way.

The Mole is a most voracious animal, and is incapable of sustaining even a slight fast. Its principal food is the earth-worm, in chase of which it drives its long galleries underground; but it also will eat insects, bits of meat, and is said sometimes to catch birds, which it takes by surprise, and then rapidly tears to pieces with its powerful claws. This ravenous appetite causes it to suffer from thirst if a supply of water is not at hand. For this reason the Mole always makes a tunnel towards a pond or brook, if there is one near. If no water is near, it digs a number of little wells, which receive the rain or dew, and enable it to quench its thirst. It is a good swimmer, and can pass from bank to bank, or from the shore to an island, and when the fields are inundated by floods it can save itself by swimming.

The construction of the Mole's habitation is very singular and interesting. Each Mole has its own habitation and hunting-ground, and will not permit strangers to trespass upon its preserves, which it guards by its claws and teeth.

Its passion for work, *i.e.*, search after its food, has something fierce in it. The animal works desperately for several hours, and then rests for as many hours. Its mode of burrowing is by rooting up the earth with its snout, and then scooping it away with its fore-feet. The depth at which this animal works depends almost entirely on the time of year. In the summer the worms come to the surface, and the Mole accordingly follows them, making quite

superficial runs, and sometimes only scooping trenches on the surface. But in the winter, when the worms sink deep into the ground, the Mole is forced to follow them there, and as it cannot fast above an hour or two, it is forced to work at the hard and heavy soil as it did in the light earth nearer the surface.

Moles vary in color, the usual tint being a very deep brown, almost black, but they have been seen of an orange color, and a white variety is not uncommon. I have a cream colored skin in my possession. There are several Moles known—the Shrew Mole, the Changeable Mole, the Cape Mole, and the Star-nosed Mole, are the most conspicuous.

THE SHREW MOUSE is very like the Common Mouse, but is easily distinguished from it by the length of the nose, which is used for grubbing up the earth in search of earth-worms and insects.

The Shrew has no connection with the true mice. It belongs to an entirely different class of animals, its teeth being sharp and pointed, while those of the Mouse are broad and chisel-shaped, like the teeth of the rabbit. A peculiar scent is diffused from these animals, which is possibly the reason why the cat will not eat them, although she will readily destroy them.

Many species of Shrews are known, inhabiting various countries. There are, besides the common species, the Oared and the Water Shrew. The formation of their hair as seen under a microscope is very beautiful, but quite distinct from the hair of the Mouse or Rat. In the autumn, numbers of these little animals may be seen lying dead, but what causes this destruction is not known.

This is one of the numerous animals that have suffered by false reports, and have been treated with great cruelty on account of those fables. Rustics formerly believed that the poor little harmless creature paralyzed their cattle by running over them, and that the only way to cure the dis-

eased animal was to place a bough of shrew-ash on the injured part. A Shrew cut in half and placed on a wound supposed to be caused by its bite was considered a remedy.

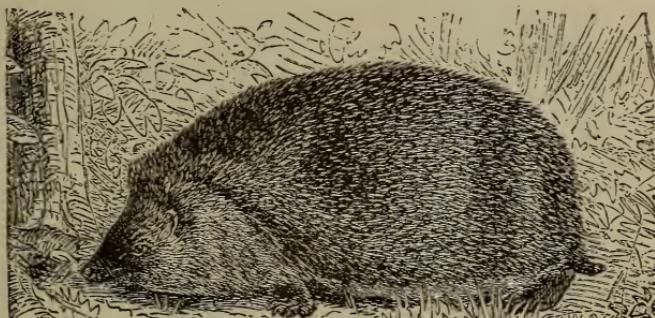
The HEDGEHOG is one of the remarkable animals that is guarded with spikes. These spikes are fixed into the skin in a very beautiful and simple manner. When annoyed it rolls itself up, and the tightness of the skin causes all its spines to stand firm and erect, bidding defiance to an unprotected hand. While rolled up, even the dog and the fox are baffled by it; but their ingenuity enables them to overcome the difficulty by rolling it along until they push it into a puddle or pool, when the astonished Hedgehog unrolls itself to see what is the matter, and before it can close itself again is seized by its crafty enemy.

Its food consists of insects, snails, frogs, mice and snakes. Buckland placed a snake in the same box with the Hedgehog. The Hedgehog gave the snake a severe bite, and then rolled itself up, this process being repeated until the spine of the snake was broken in several places; it then began at the tail and ate the snake gradually, as one would eat a radish. It has been known to bore down and eat the roots of the plantain, leaving the leaves and the stem untouched.

The flesh of the Hedgehog is said to be good eating, and the gypsies frequently make it a part of their diet, as do the people in some parts of France and Belgium.

During the winter it lives in a torpid state, in a hole well lined with grass and moss, and when discovered looks like a round mass of leaves, as it has rolled itself among the fallen foliage, which adheres to its spikes. The quill is, as it were, pinned through the skin and retained by the head. The curvature is such, that when the animal contracts itself the quills are drawn upright, and form a strong and elastic covering, useful for more purposes than merely defense from foes. The Hedgehog has

been known to throw itself boldly from a considerable height, trusting to the elasticity of the spring for breaking

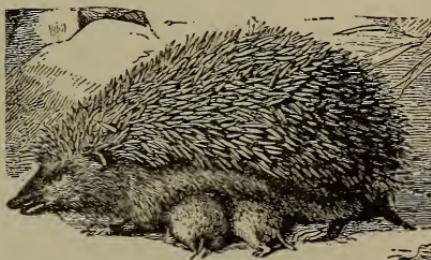


COMMON HEDGEHOG.

its fall. When the spines are upright the shock of the fall would not tend to drive the end of the quill upon the animal, but merely spend its force upon the elasticity of the curved portion.

The KANGAROO. In the Mole we saw that the power of the body was placed chiefly in the fore-legs; we now come to a family which has the principal power placed in the hinder-part of the body. In the Kangaroos the hind-legs are very long and immensely powerful; the fore-legs are very small, and used more as hands than for walking; the tail also is very thick and strong, and assists the animal in its leaps.

The Great Kangaroo inhabits Australia. Its singular



HEDGEHOG AND YOUNG.

formation, peculiarly adapted to the country, calls forth a corresponding degree of ingenuity on the part of the natives, who live much on its flesh. Its method of progression is by immense leaps from its long hind-legs.

The natural walking position of this animal is on all four legs, although it constantly sits up on the hinder-legs, or even stands on a tripod composed of its feet and tail, in order to look out over the tops of the grass among which it lives. The leaping movements are required for haste or escape, the length of each leap being about fifteen feet.

Hunting this animal is a favorite sport. The natives either knock it down with the boomerang, spear it from behind a bush, or unite together and hem in a herd, which soon fall victims to the volley of clubs, spears and boomerangs which pour in on all sides. The colonists either shoot it or hunt it with dogs, a pack of which is trained for the purpose just as we train fox-hounds. The "old man," or "boomer," as the colonists call the Great Kangaroo, invariably leads the dogs a severe chase, always attempting to reach water and escape by swimming. It is a formidable foe to the dogs when it stands at bay, as it seizes the dog with its fore legs, and either holds him under water until he is drowned, or tears him open with a well-directed kick of its powerful hind-feet, which are armed with a very sharp claw.

The female Kangaroo carries its young about in a kind of pouch, from which they emerge when they wish for a little exercise, and leap back again on the slightest alarm. All the Kangaroos and the Opossums have this pouch.

The length of the Great Kangaroo is about five feet, without the tail, the length of which is about three feet.

There are many species of Kangaroo, the most extraordinary being the Tree Kangaroo, which can hop about on trees, and has curved claws on its fore-paws, like those of the Sloth, to enable it to hold on the branches.

The Opossum inhabits North and South America, and is



KANGAROO.

hunted with almost as much perseverance as the Raccoon, not, however, for the sake of its fur, but of its flesh. When it perceives the hunter, it lies still between the branches, but if disturbed from its hiding-place, it attempts to escape by dropping among the herbage and creeping away.

Its food consists of insects, birds, eggs, etc., and it is very destructive among the hen-roosts. The Opossum uses its tail for climbing and swinging from branch to branch, as the Spider-Monkeys use theirs, but the Opossum uses its tail in a manner that the Monkeys have never yet been observed to do, that is, making it a support for its young, who sit on its back and twist their tails round their mother's in order to prevent them from falling off.

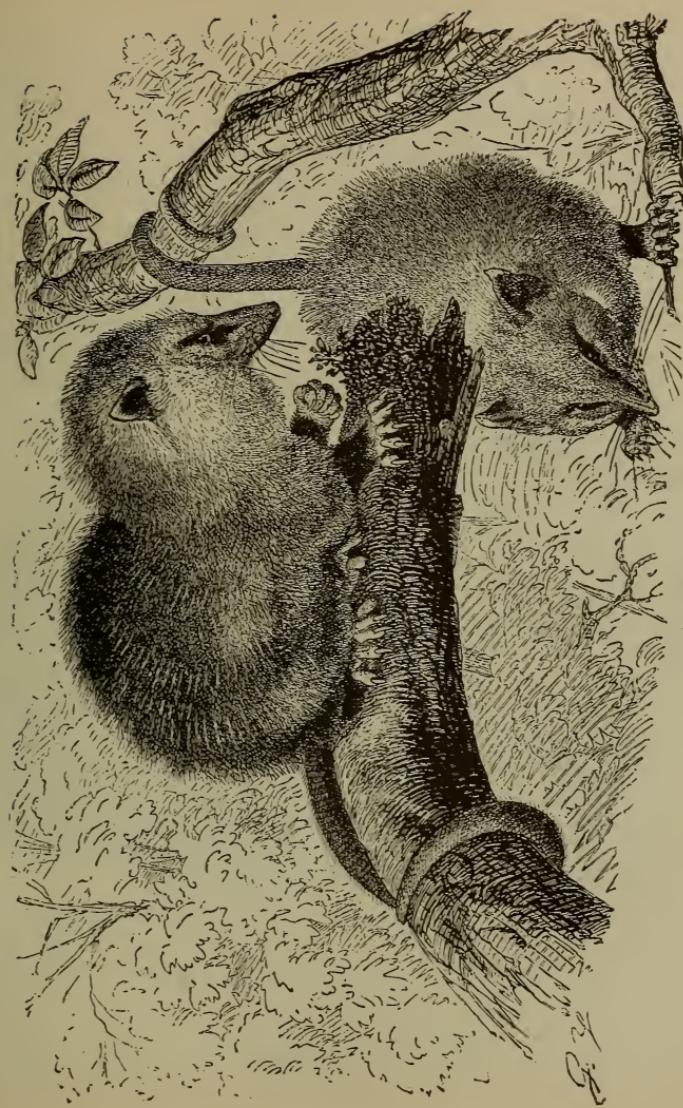
It is a most crafty animal, and when overtaken by its pursuers can simulate death so admirably that it frequently deceives the foe, and quietly makes its escape.

The length of the Opossum is about twenty-two inches, and its height about that of an ordinary cat. When disturbed or alarmed, it gives out a very unpleasant odor. The name Opossum is derived from the Indians.

The **SEALS** and **WHALES**, although they are truly **mammalia**, are inhabitants of the water, and specially formed for an aquatic existence.

The fore-feet of the seal are used as fins, and the two hinder-feet almost as the tail of a fish, to assist and direct its course. On land its movements are very clumsy ; it shuffles along by means of its fore-feet, or rather paddles, and drags its hind-feet after it.

Seals live during warm weather mostly in the cold regions of the north and south poles, and go into milder waters in the winter. Their food is chiefly fish, and they sometimes chase salmon quite far up rivers. They like to bask in the sun upon rocks, sand-banks or ice-floes, always keeping a good lookout for danger. They can see far, and their sense of smell is very sharp.



OPOSSUM.

Seals mostly live on mollusks, crabs and fish. In the winter they make holes in the ice, where they can come up to breathe. Sometimes one comes out to eat a fish. The Esquimaux watch near seal holes until one is seen coming up, then crawl softly along on the ice, making a cry like a seal, and the poor animal, who takes it for another seal, does not discover its mistake until it gets a deadly blow.

Seals are among the most useful of animals to man. The Greenlanders use their flesh for food; their oil for light, warmth and cooking; their skins for clothes, boots and coverings of boats and tents; their sinews for thread and fishing lines; the skins of the entrails for window-curtains and shirts, and their blood for making soup. Seal-skins are an important article of commerce, and the seal-fishery is largely carried on along the coast of Newfoundland and Labrador, and also on the islands off the coast of Alaska. The fur in its natural state is yellowish, spotted and marked with brown, and is unfit for use until it is dyed. Dressed seal-skins are largely used for ladies' cloaks, capes, etc. The skins are tanned sometimes and made into a fine soft leather for pocketbooks, card-cases and other things. Seal-oil, made from the blubber of fat, is more valuable than whale-oil.

The length of the Common Seal is about five feet, and its weight often over 200 pounds. When surprised basking on the shore, it scrambles off towards the water, but if intercepted, dashes at its antagonist, oversets him if possible, and makes its escape as fast as it can.

There are many Seals known, among which are the Sea Leopard, a spotted species; the Harp Seal, so called because the markings on its back resemble a lyre; the Sea Bear and the Sea Lion.

The WALRUS inhabits the northern seas. Its most remarkable point is the great length of its upper canine teeth, which extend downwards for nearly two feet, and

resemble the tusks of the elephant. They furnish very fine ivory, and are used by dentists in making artificial teeth, as teeth made from them remain white much longer



SEALS SWIMMING.

than those made from the tusks of elephants. These tusks are used by the Walrus for climbing the rocks or heaps of ice, and also for digging up the seaweeds on which the animal mostly subsists. It will also eat shrimps and young seals.

The Walrus is hunted for the sake of its oil, its flesh, its skin and its teeth. It is generally found in troops, and if one is wounded, its companions rush to its rescue and attack the enemy with their sharp tusks, which they have been known to drive through the bottom of a boat. The length of the Walrus is about fifteen feet, and it yields about twenty-five gallons of excellent oil.

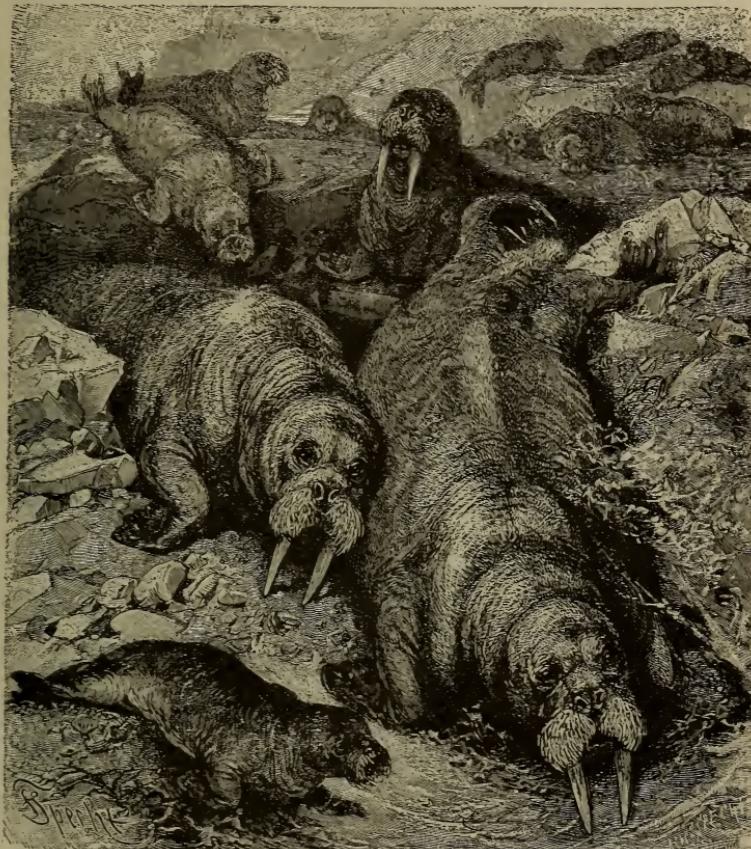
The WHALE tribe closely resemble the fishes, and have often been placed among these animals by naturalists. They, however, are distinguished by possessing warm blood, and, in consequence, being forced to rise at intervals in order to breathe the air, instead of separating from the water, by means of their gills, sufficient oxygen for supporting life.

Yet the Whale remains under water for a time so much longer than could be borne by any other warm-blooded animal, that the most indifferent observer cannot fail to perceive that the Whale is furnished with some plan for supporting life during its stay beneath the water.

Along the interior of the ribs is a vast collection of blood-vessels, ramifying from one another and capable of containing a large quantity of blood, having no immediate connection with that portion of the blood which is already circulating in the body. As fast as the exhausted and poisonous blood returns from its work it passes into another reservoir adapted for its necessities, while a portion of the arterialized blood in the arterial reservoir passes into the circulation. It will be seen from this that the Whales, and others of the same order, possess more blood in proportion than any animals. By means of this wonderful apparatus a whale can remain below the water for more than half an hour at a time.

The depths to which the Whale can descend are astonishing, wounded whales having been known to take down perpendicularly nearly 800 fathoms of line. The pressure of the water at this depth is very great, amount-

ing, according to Scoresby's calculation, to 211,200 tons. This pressure would certainly cause the water to burst



WALRUSES ON THE ICE.

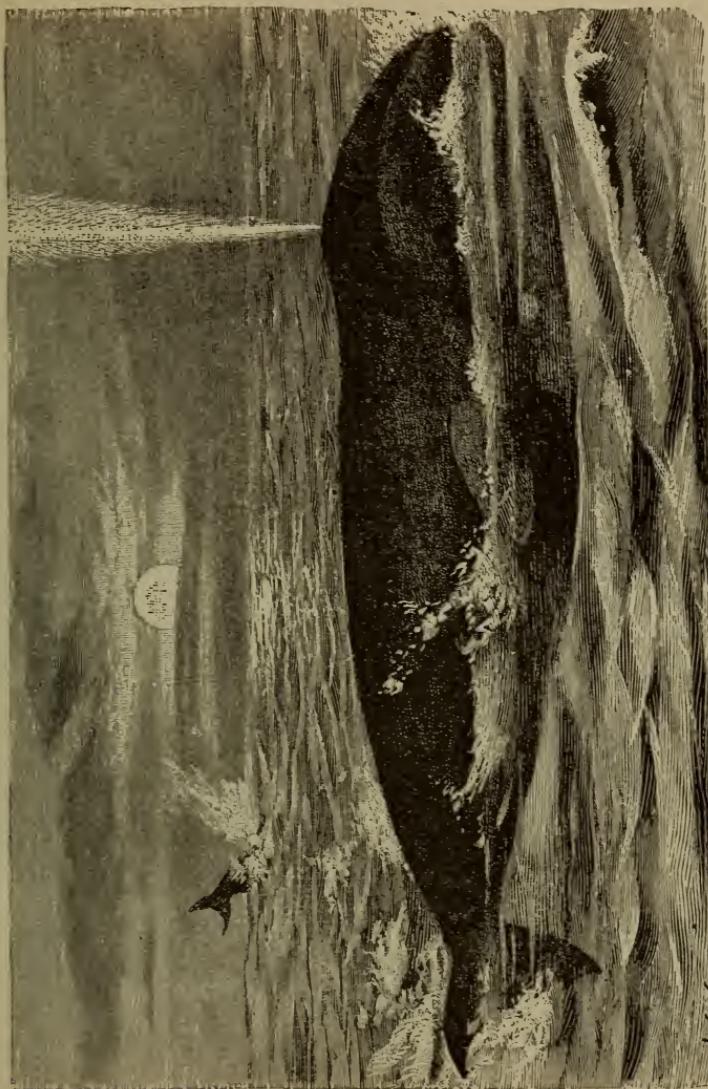
through their nostrils and enter the lungs, were it not that the nostrils are formed so as to close themselves more firmly as the pressure of water increases.

The great GREENLAND WHALE is found in the Northern Oceans. Many ships are annually fitted out for the capture of this creature, which furnishes oil and whalebone. The oil is obtained from the thick layer of fatty substance called blubber, which lies under the skin ; and the whalebone—which, by the way, is not bone at all—is obtained from the interior of the mouth, where it fringes the jaws, and acts as a sieve for the Whale to strain his food through. The throat of the Greenland Whale is so small, that the sailors say that a penny loaf would choke a whale. The greater proportion of its food consists of a little creature, about an inch and a half long, called *Clio borealis*, one of the marine Mollusca, belonging to the class Pteropida, or wing-footed creatures, so called because it propels itself through the water with two wing-like organs. The Whale, when it wishes to feed, rushes through the water with its immense jaws wide open, inclosing a host of little sea animals and a few hogsheads of water. As the Whale only wants the animals, and not the water, it shuts its mouth and drives all the water out through the fringes of whalebone, leaving the little creatures in its jaws.

The Whale shows great attachment to its young, which is called the cub, and on the approach of danger seizes it with its fin or flipper, and carries it down out of danger. The Whale has no fins, properly so called, as it is not a fish, but one of the mammalia. Its flippers, which supply the place of fins, are in fact fore-legs, furnished with a kind of hand covered with a thick skin. They seem to be principally employed in balancing the animal. The hind-legs are wanting. The length of this Whale averages sixty feet. Its tail is placed transversely, and not vertically, as in the fishes.

The SPERMACETI WHALE is not furnished with “baleen,” or whalebone, but is armed with a number of strong conical teeth, which are placed in the lower jaw, and which are often used in defending itself from the attacks of the

GREENLAND WHALE.

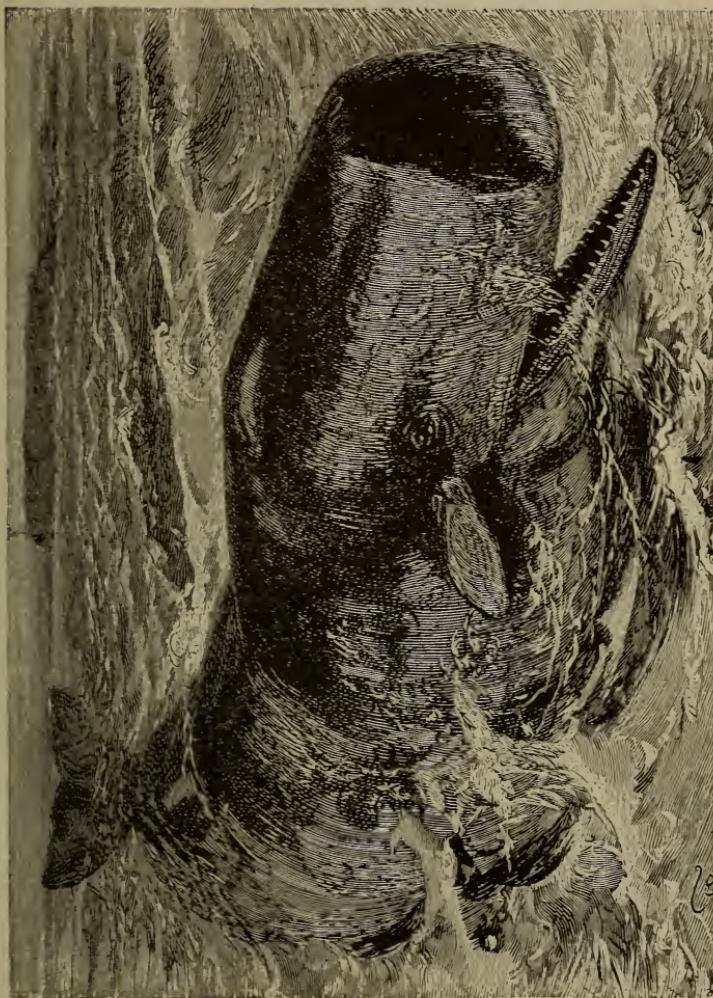


whalers' boats. In the Oxford Museum is an under jaw-bone of this Whale, sixteen feet in length, containing forty-eight huge teeth. Besides this method of defense, it has a very unpleasant habit of swimming off to a distance, and then rushing at the boat with its head, thereby knocking it to pieces. One of these Whales actually sank a ship by three or four blows from its head.

Spermaceti is obtained from the head of the Whale, and it is this substance that causes the immense size of the head. When killed, a hole is made in the upper part of the head, and the spermaceti is baled out with buckets. When just procured it is almost fluid, but is rendered solid and transparent by being first drained of its oil, then boiled in water, and lastly set to cool in wide pans, where it soon assumes the white, flaky appearance so well known in this country. The skull occupies but a small portion of the head, the huge mass at the end of the mouth being composed of a gristly kind of substance. The bone of the upper jaw occupies about one-fourth of the distance between the mouth and the top of the snout. It runs backwards nearly straight until just before the eyes, when it joins the remainder of the skull with a bold sweep. That part of the skull is called "Neptune's Chair" by the sailors, and is the part where the spermaceti is found. The layer of blubber is thin, but yields a fine and valuable oil. Ambergris, so long a riddle to all inquirers, is now found to be produced in the interior of this Whale. This substance is of the consistency of wax, inflammable, and gives out a kind of musky odor. It was once in great repute as a medicine, but is now only used as a perfume.

Although an inhabitant of the Arctic seas, it has sometimes been found and captured off the English coasts. The length of this Whale is about seventy feet.

Those readers who have formed their ideas of DOLPHINS from the very graceful and elegant creatures represented



THE SPERM WHALE.

under that name in the pictures of the "old masters," will find that the real animal differs greatly from the ideal. Almost the whole history of the Dolphin is imaginary—very poetical, but very untrue. Our Dolphin, when we have harpooned and brought him on deck, is only black and white, and all the change that he makes is that the black becomes brown in time, and the white changes to gray.

The creature that really displays colors when dying is a fish called the Coryphene. The sailors generally call it the Dolphin, which has led to the mistake. The Dolphin is, like the Whale, a warm-blooded animal, suckles its young, and is forced to come to the surface in order to breathe. Its snout is very long, and is apparently used for capturing such fish and other animals as live in the mud. The length is from six to ten feet. Several species are known.

PORPOISES may be observed in plenty playing their absurd antics off every coast of America. They frequent the mouths of rivers, because they find more food there than in the open sea. They tumble at the surface of the water for the purpose of breathing.

In the olden times, when glass windows were considered a luxury, and rushes supplied the place of carpets, the flesh of the Porpoise constituted one of the delicacies of a feast, but it has long since been deposed from rank at the table. Its flesh has a very strong, oily flavor.

The Porpoise feeds on various fishes, but its great feasts are held when the periodical shoals of herrings, pilchards, and other fish arrive on the coasts. In the pursuit of its prey, it frequently ventures some distance up a river, and is then often taken in nets by the fishermen.

Its teeth are numerous, and interlock when the jaws are closed, so that the fish when once seized cannot escape. Its length is about five feet; its color a rich black, becoming white on the under side.

The NARWHAL unwittingly contributed to propagate a very old error. Its spiral tusk used to be sold as the real horn of the unicorn; and as an accredited part of that animal, forming direct proof of its existence, it used to fetch a high price. When the Whale fishery was established, the real owner of the horn was discovered, and the unicorn left still enveloped in mystery.

The Narwhal possesses *two* tusks, one on each side of its head. Only the left tusk projects, the other remaining within the head. Sometimes a specimen has been found with both tusks projecting, and some think that when the left tusk has been broken off by accident, the right one becomes large enough to supply its place. Although an inhabitant of the northern seas, it has several times visited English coasts. Its body is from thirty to forty feet in length, and its tusk from five to nine.

The RODENTIA, or gnawing animals, are so called from their habit of gnawing through, or paring away, the substances on which they feed. For this purpose their teeth are admirably formed, and by these teeth it is always easy to ascertain a member of the Rodents. They have none of those sharp teeth called canine, such as are seen in the Lions and in those animals which seize and destroy living animals, but in the front of each jaw there are two long, flat teeth, slightly curved, and having a kind of chisel-edge for rasping away wood or other articles.

The constant labor which these teeth undergo would rapidly wear them away. To counteract this loss, the teeth are constantly growing and being pushed forward, so that as fast as the upper part is worn away the tooth is replenished from below. So constant is this increase that, when an unfortunate rabbit or other rodent has lost one of its incisors, the opposite one, meeting nothing to stop its progress, continually grows, until sometimes the tooth curls upwards over the lips and prevents the wretched animal from eating, until it is gradually starved to death.

The BROWN RAT, sometimes called the Norway Rat, is the species usually found in England and America. It was imported into England and from thence here, and from its superior size, strength, and ferocity, has completely established itself and expelled the original Black Rat.

It is at all times difficult to get rid of these dirty, noisy animals, for they soon learn to keep out of the way of traps, and if they are poisoned they revenge their fate by dying behind a wainscot or under a plank of the floor, and make the room uninhabitable. There are, however, two ways recommended to attain the desired object:

Place a saucer containing meal in a room frequented by Rats, letting them have free access to it for several days. They will then come to it in great force. When they have thus been accustomed to feed there regularly, mix a quantity of jalap with the meal, and put it in the accustomed place. This will give them such internal tortures that they will not come near the place again.

A second plan is to mix phosphorus with the meal and make it into a ball. The phosphorus is said not to kill the Rats, but to afflict them with such a parching thirst that they rush to the nearest water and die there. By this method the danger of their dying in the house is avoided.

The Common MOUSE is so well known that a description of its form and size is useless. It almost rivals the Rat in its attacks upon our provisions, and is quite as difficult to extirpate. It brings up its young in a kind of nest, and when a board of long standing is taken up in a room, it is not uncommon to find under it a Mouse's nest, composed of rags, string, paper, shavings, and everything that the ingenious little architect can scrape together. It is a round mass, looking something like a rag ball very loosely made. When opened, seven or eight little mice will probably be found in the interior—little, pink, transparent creatures, sprawling about in a most unmeaning manner, apparently

greatly distressed at the sudden cold caused by the opening of their nest.

A white variety of Mouse is tolerably common, and is usually bred in cages. As it is very tame and beautiful, it is in some repute as a pet.

The HARVEST MOUSE is very much smaller than the ordinary mouse. Its nest is raised about a foot from the ground, and supported on two or three straws. It is made of grass, about the size of a cricket-ball, and very compact.

The WATER RAT is common on banks of rivers, brooks, etc. I have watched them feeding, and never saw them eating fish, nor found fish-bones inside their holes, except when a kingfisher had taken possession; but I have seen them gnawing the bark from reeds, which they completely strip, leaving the mark of each tooth as they proceed.

North America is the principal country where the BEAVER is found, but it is also common on the Euphrates, and along the Rhone and the Danube.

The houses of the Beaver are built of mud, stones, and sticks. They are placed in a stream, and their entrance is always below the surface. As a severe frost would freeze up their doors, it is necessary to make the stream deep enough to prevent the frost from reaching the entrances. This object is attained by building a dam across the river, to keep back the water until it is sufficiently deep for the Beaver's purposes. The dam is made of branches, which the Beaver cuts down with its strong, sharp teeth, and mud and stones worked in among the branches. The Beavers throw these branches into the water, and sink them to the bottom by means of stones, and by continually throwing in fresh supplies a strong embankment is soon made.

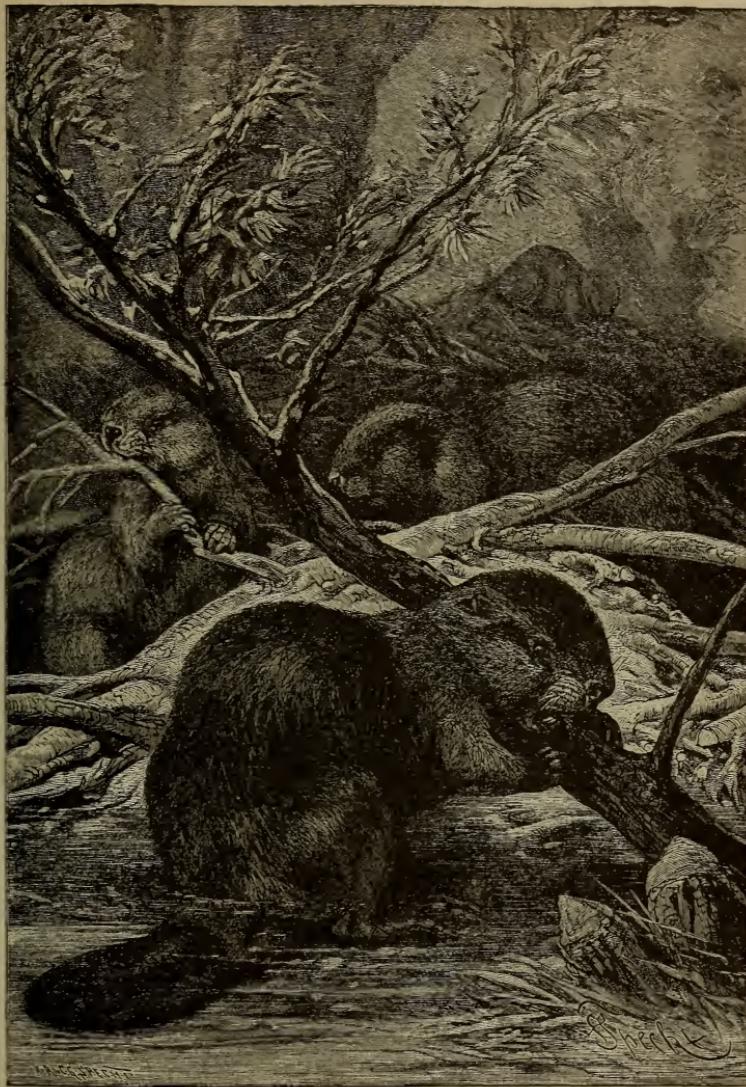
As many Beavers live together in one society, the formation of a dam does not take very long. By their united efforts they rapidly fell even large trees, by gnawing them round the trunk, and always take care to make them fall

towards the water, so that they can transport the logs easily. The mud and stones used in their embankments are not carried on their tails, as some say, nor do the Beavers use their tails as trowels for laying on the mud, the fact being that the stones and mud are carried between their chin and fore-paws, and the mistake respecting the tail is evidently caused by the slap that Beavers give with that member when they dive. In order that their pond may not be too deep they always leave an opening in the dam to let the water escape when it rises above a certain height.

During the severe winter their mud-built houses freeze quite hard, and prevent the Wolverine, their greatest enemy, except man, from breaking through and devouring the inmates. Every year the Beavers lay a fresh coating of mud upon their houses, so that after the lapse of a few years the walls of the house are several feet in thickness. Many of the houses are built close together, but no two families can communicate with each other except by diving below the walls and rising inside their neighbors' houses.

When in captivity the Beaver soon becomes tame, and will industriously build dams across the corner of a room with brushes, boots, fire-irons, books, or anything it can find. When its edifice is finished, it sits in the centre, apparently satisfied that it has made a beautiful structure to dam up the river—a proof that the ingenuity of the Beaver is not caused by reason, but by instinct.

Its fur consists of a fine wool intermixed with long and stiff hairs. The hairs are useless, but the peculiar construction of the fur causes it to penetrate and fix itself into the felt which forms the body of a hat. In making the hat, the only method required to fasten the fur into the felt is to knead the fur and felt together. The hair is toothed on its surfaces, and makes its way into the felt, just as an awn of barley will travel all over the body if placed up the sleeve. The length of the Beaver is about $3\frac{1}{2}$ feet.



BEAVERS AT WORK.

The PORCUPINE is found in America, Africa, Tartary, Persia, India and some parts of Europe. It lives in holes which it digs in the ground, and only comes forth at night to feed. It eats vegetable substances only, such as roots, bark and other similar substances. The array of spines or quills with which this animal is covered forms its principal means of defense. If it cannot escape, it suddenly stops, erects all its quills and runs backwards against its adversary, striking the quills against him by the weight of its body. Occasionally a looser quill than usual remains in the wound or falls on the ground, which evidently gave rise to the foolish error that the Porcupine could dart its weapons at its adversary from a distance. There are two kinds of these quills—one kind long and curved, the other short, thick and pointed. These last are the weapons of defense, as the former are too slender to do much service. When it walks its quills make a kind of rustling sound, caused principally by those arranged on the tail, which are large, hollow, and supported on large, slender stalks.

The Indians use the quills for ornamenting various parts of their dress, especially their moccasins or skin shoes. The length of the Porcupine is about two feet, and its spines or quills are from six to fourteen inches long.

The CAPYBARA is the largest of all the Rodentia. At first sight it looks very like a pig, and its skin is covered thinly with hairs like bristles, which add to the resemblance. It inhabits the borders of lakes and rivers in many parts of South America. During the day it hides among the thick herbage of the banks, only wandering forth to feed at night, but when alarmed it instantly makes for the water, and escapes by diving. It is hunted for the sake of its flesh, which is said to be remarkably good. The food of the Capybara consists of grass, vegetables and fruits. Its length is about forty-two inches.

The GUINEA-PIG was originally brought from South



PORCUPINE.

America. Its beauty is its only recommendation, as it shows little intelligence and is never used for food. Children are fond of keeping them, as they are wonderfully prolific, easy to manage and do not make much noise. They are supposed to keep off rats, and are therefore patronized in connection with rabbit-hutches.

The HARE is one of our most common quadrupeds. When full-grown it is larger than the Rabbit and exceedingly like that animal. But its color is slightly different, and the black spot on the extremity of its ears is a simple method of distinguishing it. It does not burrow like the Rabbit, but makes a kind of nest of grass and other materials. In this nest, called a "form," the Hare lies, crouching to the ground, its ears laid along its back, and trusting to its concealment, will often remain quiet until the foot of an intruder almost touches it.

Innumerable foes besides man surround this animal. Foxes, ferrets, stoats and all their tribe are unmerciful enemies, and sometimes a large hawk will destroy a leveret, as the young Hare is called. Although destitute of all means of defense, it often escapes by the quickness of its hearing and sight, which give it timely warning of the approach of an enemy.

In cold countries it changes its fur during winter, and becomes white, like the Arctic Fox and the Ermine.

The RABBIT is smaller than the Hare, but closely resembles it in form. It lives in deep holes, which it digs in the ground. The female Rabbit forms a soft nest at the bottom of her burrow, composed of fur torn from her body, of hay and dried leaves. Here the young Rabbits are kept until they are strong enough to shift for themselves and make their own burrows. The tame Rabbit is only a variety rendered larger by careful feeding and attendance.

The GERBOAS are celebrated for their powers of leaping. Their long hind-legs enable them to take enormous springs,

during which their tails serve to balance them. Indeed a Gerboa when deprived of his tail is afraid to leap.

In the history of the Polar Bear it was mentioned that its feet were prevented from slipping on the ice by a coating of thick hair. The foot of the Gerboa is defended in the same manner by long, bristly hairs, which gives the creature a firm hold of the ground for its spring, and also defends the foot from the burning soil on which it lives.

It is very timid, and on the slightest alarm rushes to its burrow, but if intercepted skims away over the plain with such rapidity that it seems to fly, and when at full speed a swift greyhound can scarcely overtake it.

Grain and bulbous roots are its chief food ; while eating it holds the food with its fore-paws and sits upright on its haunches, like the Squirrels and Marmots.

The DORMOUSE is common in all the warmer parts of Europe. It lives in copses and among brushwood, through which it makes its way with such rapidity that it is very difficult to capture. During the winter it lies torpid, but takes care to have a stock of food laid up, on which it feeds during the few interruptions to its slumbers. A warm day in winter will usually rouse it, but during the cold weather it lies rolled up, with its tail curled round its body. While in this state a sudden exposure to heat kills it, but a gentle warmth, such as holding it in the hand, rouses it without injury. It lives principally on nuts, acorns and grain. It brings up its young in a nest composed of leaves and hay, and seems to be fond of society in its household labors, as ten or twelve nests have been seen close to each other.

The SQUIRREL is a very common animal in woods, where numbers may be seen frisking about on the branches, or running up and down the trunks. If alarmed it springs up the tree and hides behind a branch. By this trick it escapes its enemy the hawk, and by constantly slipping behind the large branches, frequently tires him out. The

activity and daring of this little animal are extraordinary. When pursued it makes the most astonishing leaps from branch to branch, or from tree to tree, and has apparently some method of altering its direction while in the air, possibly by means of its tail acting as a rudder.

It is easily domesticated, and is very amusing in its habits when suffered to go at large in a room or kept in a spacious cage; but when confined in one of the cruel wheel cages its energies and playfulness are quite lost. Men often go about with squirrels for sale, and generally cheat those who buy them. They try to sell old squirrels for young, but this imposition may be detected by looking at the teeth of the animal, which are nearly white if young, but if old are of a light yellow. The purchaser should beware of very tame and quiet squirrels. These are generally animals just caught and perfectly wild, but made sedate by a dose of opium.

Its color is a deep reddish brown, and its tail so large and bushy as to shade its whole body when carried curled over its back.

The Ruminanti, or those animals that chew the cud, include the oxen, sheep and goats, deer, giraffe and camels. They have a peculiar construction of stomach, which receives the freshly-gathered food, retains it for some hours, and then passes it back into the mouth to be remasticated.

The Ox is spread widely over the earth, scarcely any country being without its peculiar breed. In England, where it is the most useful domesticated animal, there are many breeds, generally distinguished by the length or shape of their horns. There is the "long-horned breed," the "short-horned," the "middle-horned" and the "polled" or hornless breed. Each of these breeds has its peculiar value: some fatten easily, and are kept especially for the butcher; others give milk, and are valuable for the dairy. The best dairy cow is the Alderney, a small, short-

horned animal, furnishing very rich milk. The Texas cattle are descended from Spanish stock.

In some parts of America oxen are used to draw wagons, or to drag the plow. They are not so strong as horses, and their movements are much slower.

Every part of the Ox is of value. We eat his flesh, we wear shoes soled with his skin, our candles are made from his fat, our tables are joined with glue made from his hoofs, his hair is mixed with the mortar of our walls, his horns are made into combs, knife-handles, drinking-cups, etc., his bones are used as a cheap substitute for ivory and the fragments ground and scattered over the fields as manure, and soup is made from his tail.

The young Ox is called a calf, and is quite as useful in its way as the full-grown Ox. The flesh is termed veal, and by many preferred to the flesh of the Ox or Cow, which is called beef; jelly is made from its feet. The stomach is salted and dried, and is named rennet. Cheese is made by soaking a piece of rennet in water and pouring it into a vessel of milk. The milk soon forms a curd, which is placed in a press, and the watery substance, called whey, squeezed from it. The curd is colored and salted, and is then cheese.

The CAPE BUFFALO is a native of South Africa. It is exceedingly ferocious and cunning, often lurking among the trees until an unsuspecting traveller approaches, and then rushing on him and destroying him. The ferocious creature is not content with killing its victim, but stands over him, mangling him with its horns and stamping on him with its feet.

The BISON is a native of Europe and North America. They have short horns, which are curved inward at the point. They are distinguished from the Ox by long woolly or shaggy hair, which covers the neck and shoulders of the males.

The American Bison is known by the incorrect name of

Buffalo. This is the only species of the Ox family indigenous to America, except the Musk Ox. It is similar to the European Bison, but the fore-parts are more shaggy, and it is a powerful and ferocious-looking animal, which no American beast can overcome or resist, except the Grizzly Bear. The color of its hair is mostly brown. In former years vast herds of Bisons roamed over the plains and prairies between the Mississippi River and the Rocky Mountains, feeding on grass and brushwood. They are generally inoffensive, and will not attack men, but prefer to run rather than to fight. During their migration they move in enormous herds, which are innumerable and irresistible. Their hides are valuable, and under the name of buffalo robes are an important article of commerce. The bisons are swift in running, and have so keen a sense of smell that the hunter cannot easily approach near enough to shoot them. The Indians circumvent them by setting fire to the prairie-grass on several sides, and thus driving them in confusion towards a central position. They also drive them over precipices in large herds, the momentum of which is such that the leaders cannot stop or retreat, being forced forward by the mass behind them. The chase of Bisons is attended with some danger, as they sometimes turn upon an assailant, who is liable to be trampled under the feet of the herd. Numerous tribes of Aborigines are mainly dependent on the Bison for their food and clothing. Their skins, which are covered with soft hair or fur, are much used for blankets, and their flesh and fat are converted into *pemmican*, the favorite food of the fur-hunters and *voyageurs* of North America. The Bison differs from the true Buffaloes in having a hump upon the back, and in the absence of the dewlap, which is small in the Buffaloes. The Buffaloes have cavities in their horns communicating with the nasal passage, the Bison has not; the horns turn outward in the true Buffaloes, and inward in the Bisons.

The flesh of the Bison is tolerable eating, but the "hump" appears to be unapproachable in delicacy. It is very tender, and possesses the property of not cloying even when eaten in excess. The fat is also said to be devoid of that



THE AMERICAN BISON.

sickening richness which is usually met with in our domesticated animals.

The cow is smaller than the bull and considerably swifter. She is also generally in better condition and fatter than her mate, and in consequence the hunters who go to "get meat" always select the cows from the herd.

The YAK inhabits Tartary. Of this animal in a native state little is known. The name of "grunniens," or grunting, is derived from the peculiar sound that it utters. The tail of the Yak is very long and fine, and is used in India as a fan or whisk to keep off the mosquitoes. The tail is fixed into an ivory or metal handle, and is then called a

chowrie. Elephants are sometimes taught to carry a chowrie, and wave it about in the air above the heads of those who ride on its back. In Turkey the tail is called a "horse-tail," and is used as an emblem of dignity.

From the shoulders of the Yak a mass of long hair falls almost to the ground, something like the mane of a Lion. This hair is applied to various purposes by the Tartars. They weave it into cloth, of which they not only make articles of dress, but also tents, and even the ropes which sustain the tents.

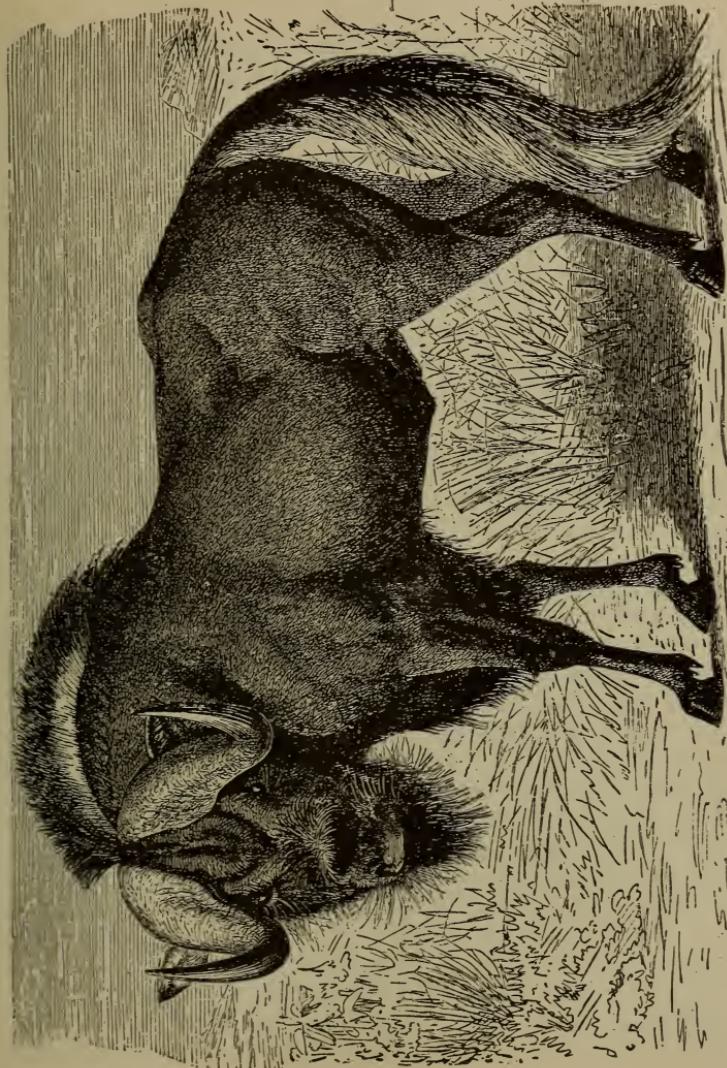
The Gnoo, or WILDEBEEST, inhabits Southern Africa. At first sight it is difficult to say whether the horse, buffalo or deer predominates in its form. It belongs to neither of these animals, but is one of the bovine Antelopes. The horns cover the top of the forehead, and then, sweeping downwards over the face, turn boldly upwards with a sharp curve. The neck is furnished with a mane like that of the horse, and the legs are formed like those of the stag. It is a very swift animal, and when provoked very dangerous. When it attacks an opponent it drops on its knees, and then springs forward with such force that, unless he is extremely active, he cannot avoid its shock.

When it is taken young, the Gnoo can be domesticated, and brought up with other cattle, but it will not bear confinement, and is liable to become savage under restraint.

There are several species of this animal, the Common Gnoo, the Cocoon and the Brindled Gnoo.

The size of the Gnoo is about that of a well-grown Ass. Its flesh is in great repute both among the natives and colonists.

The Koodoo is a native of South Africa, living along the wooded borders of rivers. It is noted for its beautifully-shaped horns, which are about four feet in length and twisted into a large spiral of about two turns and a half. A bold ridge runs along the horns and follows their curvature. When hard pressed it always takes to the water, and



THE GNOO.

endeavors to escape by its powers of swimming. Although a large animal, nearly four feet in height, it can leap with wonderful activity. The weight of the horns is very considerable, and partly to relieve itself of that weight, and partly to guard them from entanglement in the bushes among which it lives and on which it feeds, it carries its head backwards, so that the horns rest on its shoulders.

The GAZELLE inhabits Arabia and Syria. Its eyes are very large, dark and lustrous, so that the Oriental poets love to compare the eyes of a woman to those of a gazelle. It is easily tamed when young, and is often seen in the courtyards of houses in Syria. Its swiftness is so great that even a greyhound can not overtake it, and the hunters are forced to make use of hawks, which are trained to strike at the head of the Gazelle, and thus confuse it, and retard its speed, so as to permit the dogs to come up. Its color is a dark yellowish brown, fading into white on the under parts.

The CHAMOIS is found only in mountainous regions, especially the Alpine chains of Europe and Western Asia. It lives on the loftiest ridges, displaying wonderful activity, and leaping with certainty and security on places where the eye can hardly discern room for its feet. The skin of the Chamois is used extensively by shoemakers.

The IBEX inhabits the Alpine regions of Europe and Western Asia. It is recognized by its magnificent horns, which curve with a bold sweep from the head almost to the haunches. The horns are surrounded at regular intervals with rings, and are immensely strong, serving, as some say, to break the fall of the Ibex when it makes a leap from a height. Its height is thirty inches; the length of its horns often three feet.

The GOAT is not in much request in America, but in Syria and Switzerland large herds of them are kept for the sake of their milk. They almost entirely take the place of the Cow. The most celebrated variety of this

animal is the Cashmir goat, which furnishes the beautifully fine wool from which the costly Cashmir shawls are made.

There are many kinds of SHEEP, among which the Common Sheep, the Long-Tailed Sheep and the Wallachian Sheep are the most conspicuous. Next to the Cow, the Sheep is our most useful animal. California produces better wool than any country. The Spanish Sheep is finer than the English, but it is much less in quantity. The Merino, as this Sheep is called in Spain, is annually conducted from one part of the country to another, and back again. The distance traversed is upwards of 400 miles, about six or seven weeks being occupied in the journey. The proprietors of the flocks think these journeys improve the wool; probably a mistaken notion, as the stationary flocks of Leon produce quite as fine a fleece.

The Long-Tailed Sheep inhabits Syria and Egypt. Its tail is so large and so loaded with fat that, to prevent it from being injured by dragging on the ground, a board is fastened to the under side of it, and wheels are often attached to the board. The peculiar fat of the tail is considered a great delicacy, and is so soft as to be frequently used as butter. The weight of a large tail is about 70 pounds.

The Wallachian or Cretan Sheep is found in Crete, Wallachia, Hungary and Western Asia. Its horns are exceedingly large, and are twisted in a manner resembling those of the Koodoo. It is very strong, and extremely vicious and unruly. In this and several other Sheep the fleece is composed of wool and hair mixed. The hair of the Wallachian Sheep is long and silky, like that of a spaniel, and of great length, falling almost to the ground.

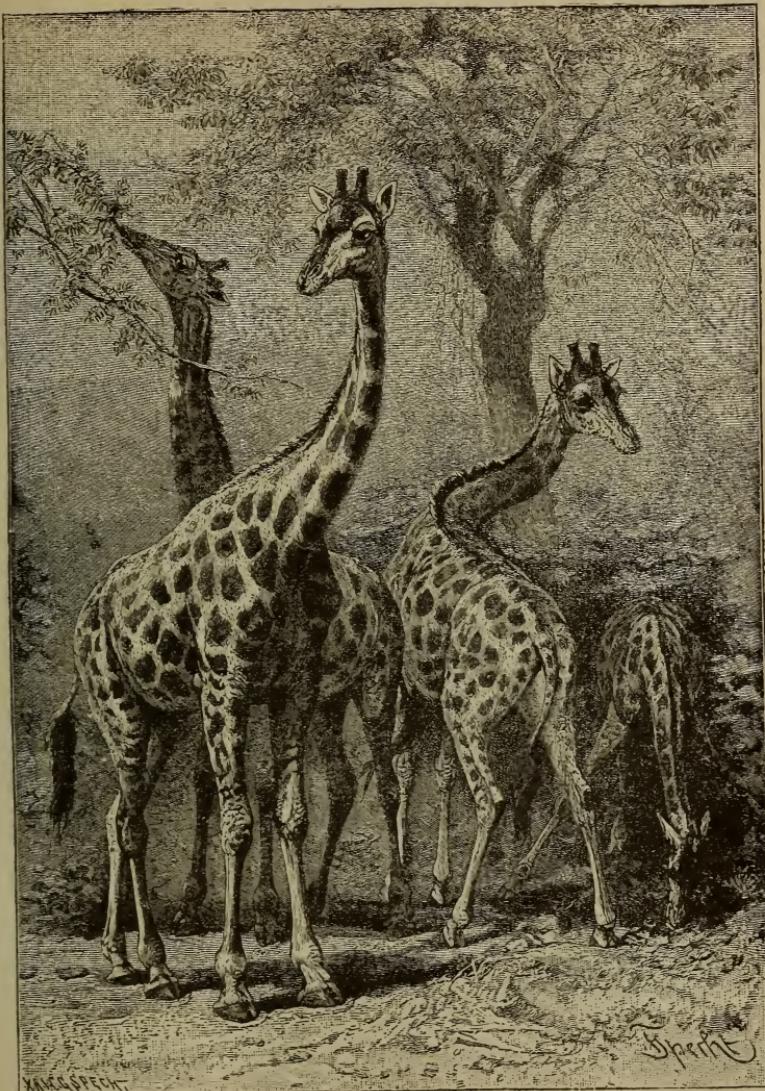
The GIRAFFE is found only in South Africa. As the Gnoo seems to combine the properties of the Antelope, Horse and Buffalo, so the Giraffe appears to bear the characteristics of the Antelope and the Camel. Naturalists say

it holds a place by itself between the Deer and Antelope. It forms, at all events, a group to which no other animals belong.

Its height varies from thirteen to eighteen feet. Its beautiful long neck enables it to browse on the leaves of the trees on which it feeds. It is very dainty while feeding, and plucks the leaves one by one with its flexible tongue. On its head are two projections, closely resembling horns. They are not horns, but only thickenings of the bone of the skull, covered with skin, and bearing a tuft of black hair at the extremity of each. The fore-legs at first sight appear longer than the hind ones, but this apparent difference is only caused by the great length of the shoulder-blades, as both pair of legs are of the same length at their junction with the body. Its eyes are very large and prominent, so that the animal can see on every side without turning its head. Just over and between the eyes is a third bony prominence, resembling the projecting enlargements of the skull, called horns. The use of these projections is not very well known, as although in play the Giraffe will swing its head round and strike with it, yet when it wishes to repel an assailant it has recourse to violent and rapid kicks from its hind-legs. So light and swift are these kicks that the eye can scarcely follow them, and so powerful are they that the lion is often driven off by them. The skin of this animal is an inch and a half in thickness, so that it is necessary for the hunter to make very sure of his aim before he fires at an animal so well defended.

The Giraffe has much difficulty in reaching the ground with its mouth, nor does it often attempt to do so, unless it is bribed with something of which it is very fond, such as a lump of sugar. It then straddles widely with its fore-legs, and with some trouble succeeds in reaching the object aimed at.

The first living Giraffes, in the possession of the London



GIRAFFE.

(91)

Zoological Society, were brought in 1835. M. Thibaut succeeded in taking four, which he brought with him. One of them is still living. From this stock several Giraffes have been born, some of which are still in England, and others have been sent to other countries.

Its tongue is one of the most remarkable parts of its structure. It is very flexible and capable of great changes of form, the Giraffe being able to contract it so that its tip could enter an ordinary quill. The animal is very fond of exercising its tongue, and sometimes pulls the hairs from its companions' manes and tails and swallows them—no very easy feat, as the hair of the tail is often more than four feet long,

The movements of the Giraffe are very peculiar, the limbs of each side appearing to act together. It is very swift, and can outrun a horse, especially if it can get among broken ground and rocks, over which it leaps with a succession of frog-like hops.

Those born and bred here seem healthy and are exceedingly tame. They eat herbs such as grass, hay, carrots, and onions. When cut grass is given to them, they eat off the upper parts and leave the coarse stems, just as we eat asparagus.

There is some confusion about the names of the camels. The BACTRIAN CAMEL is distinguished by bearing two humps on its back, the ARABIAN CAMEL by bearing only one. The Arabian is sometimes erroneously called the Dromedary; but the Dromedary is a lighter variety of that animal, and only used when dispatch is required.

The Camel forms the principal wealth of the Arab; without it he could never attempt to penetrate the vast deserts where it lives, as its remarkable power of drinking at one draught sufficient water to serve it for several days enables it to march from station to station without requiring to drink by the way. The peculiar structure of its stomach gives it this most useful power. In its stomach



THE BACTRIAN CAMEL.

are a great number of deep cells, into which the water passes, and is then prevented from escaping by a muscle which closes the mouth of the cells. When the camel feels thirsty it has the power of casting some of the water contained in these cells into its mouth. The habits of this animal are very interesting.

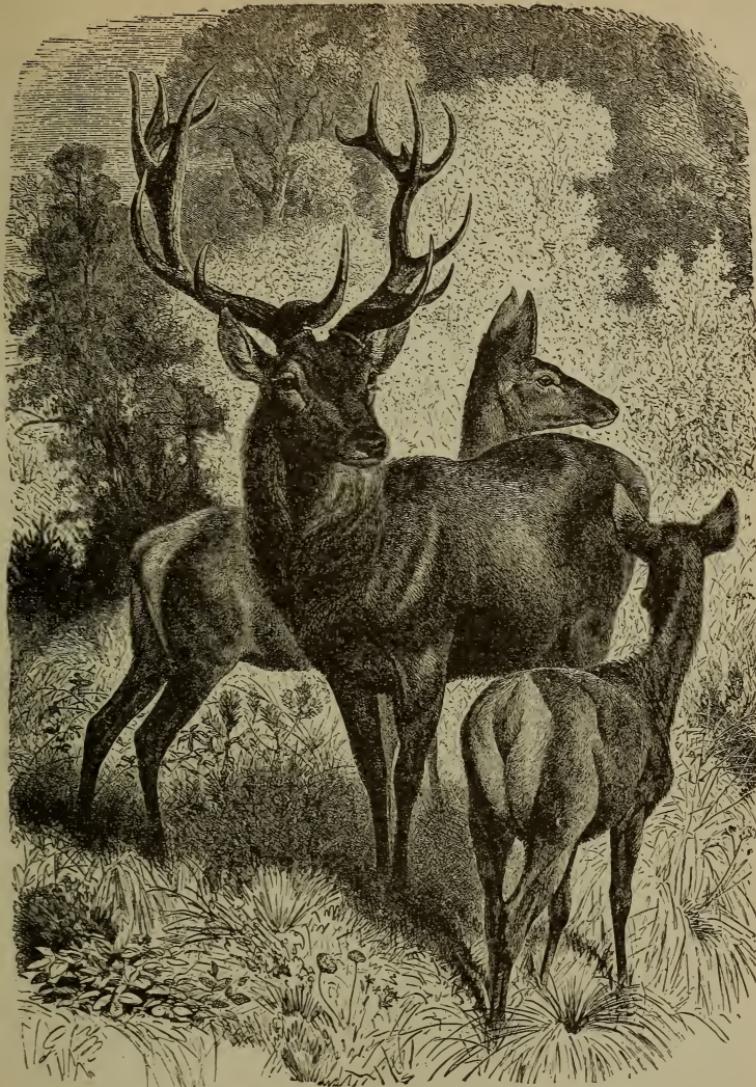
The foot of the Camel is admirably adapted for walking on the loose sand, being composed of large, elastic pads, which spread as the foot is placed on the ground. To guard it from injury when it kneels down to be loaded, the parts of the body on which its weight rests are defended by thick callosities. The largest of these callosities is on the chest, the others are placed on the joints of the legs.

The Bactrian Camel inhabits Central Asia and China.

The LLAMAS, of which there are several species, inhabit South America, and are used for the same purposes as the Camel. When wild they are very timid, and fly from a pursuer the moment that they see him; but their curiosity is so great that the hunter often secures them by lying on the ground and throwing his legs and arms about. The Llamas come to see what the extraordinary animal can be, and give the hunter an opportunity of firing several shots, which the astonished animals consider as part of the performance.

The Llamas, like the Camels, have a series of cells in the stomach for containing water, and can go for several days without requiring to drink. If too heavily laden, or when they are weary, they lie down, and no punishment will induce them to rise, so that their masters are forced to unload them. When offended they have a very unpleasant habit of spitting at the object of their anger. Their saliva is not injurious.

Its fleece is very long, resembling silk more than wool. It is very valuable, and is used for making cloth and other fabrics. The fleece of the Alpaca is considered the best, and it is sometimes twelve inches in length and very fine.



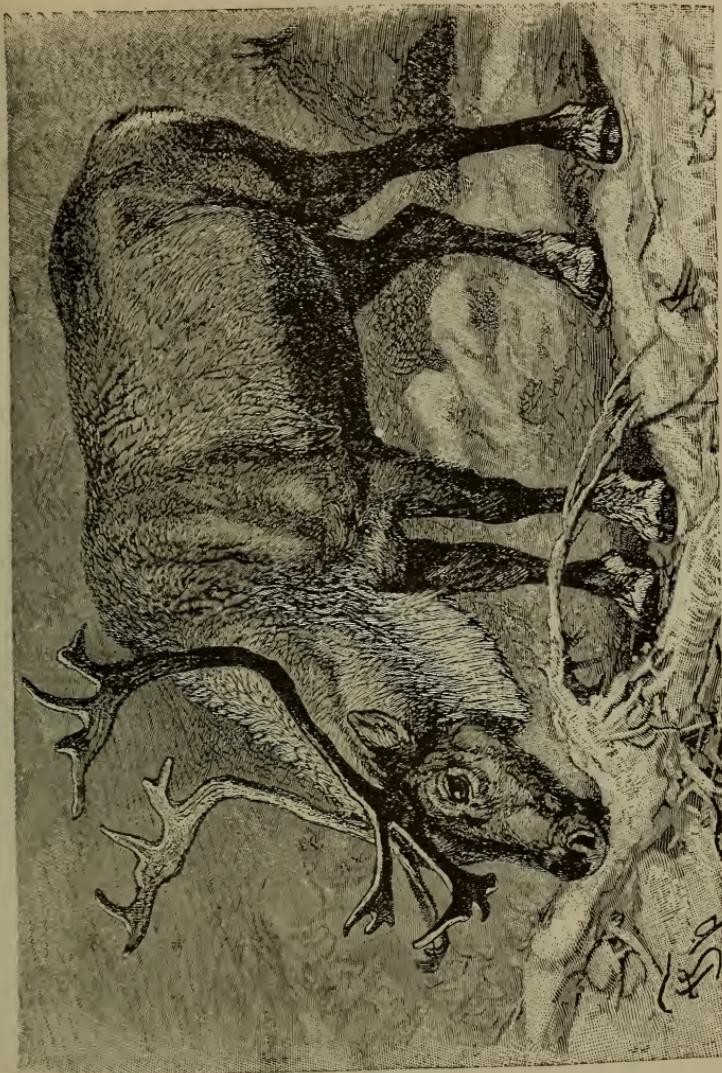
A FAMILY OF RED DEER.

In Chili and Peru the natives domesticate the Llama, which in a state of captivity frequently becomes white. It is by no means a large animal, as it measures about four feet six in height. In general shape it resembles the Camel, but has no hump on its back, and its feet are provided with sharp hoofs for climbing the rocky hills among which it lives. In Peru, where it is most commonly found, there are public shambles established for the sale of its flesh.

The RED DEER, or STAG, is the largest of the Deer. In the language of hunters it bears different names according to the size of its horns, which increase year by year. All the male Deer have horns, which they shed every year and renew again. The process of renewal is most interesting. A skin, filled with arteries, covers the projections on which the horns rest. This skin, called the "velvet," is engaged in continually depositing bone on the footstalks, which rapidly increase in size. As the budding horns increase, the velvet increases also, and the course of the arteries is marked on the horn by long furrows, which are never obliterated. When the horn has reached its full growth it cannot be at once used, as the velvet is very tender, and would bleed profusely if wounded. The velvet cannot be suddenly removed, as the blood that formed the arteries would rush to the brain and destroy the animal. A ring of bone forms round the root of each horn, leaving passages through which the arteries pass. By degrees these passages become narrow, and finally close entirely, thus gradually shutting off the blood. The velvet, being deprived of its nourishment, dies, and is peeled off by the Deer by rubbing against a tree, leaving the white, hard horn beneath.

Hunting the Stag is a favorite amusement in Europe, and packs of hounds, called Stag-hounds, are kept expressly for that purpose.

The FALLOW-DEER are usually seen in parks. One large buck always takes the lead, and suffers none but a



REINDEER.

few favorite does to approach his regal presence, all the other bucks moving humbly away when he puts in an appearance. They are generally tame, and will suffer people to come very close to them; but at a certain time of the year they become savage, and will not permit any one to approach their domains. If an intruder ventures within the proscribed distance, the buck will instantly charge upon him. They soon become familiar with those who treat them kindly, and will eat from their hands.

The REINDEER is found throughout the Arctic regions of Europe, Asia, and America. The finest animals are those of Lapland and Spitzbergen. The Laplander finds his chief wealth in the possession of the Reindeer, which not only serves him as a beast of burden, but furnishes him with food and clothing. A Laplander in good circumstances will possess about three hundred deer, which enable him to live in comfort. The subsistence of one who only possesses one hundred is very precarious, and he who has only fifty usually joins his animals with the herd of some richer man, and takes the menial labors upon himself.

The Reindeer feeds principally on a kind of lichen, which it scrapes from beneath the snow. During the winter its coat thickens, and assumes a lighter hue, many deer being almost white. Its hoofs are divided very high, so that when the animal places its foot upon the ground, the hoof spreads wide, and as it raises the foot a snapping noise is heard, caused by the parts of the hoof closing together. When harnessed to a sledge it can draw 300 pounds' weight at about ten miles an hour.

The EUROPEAN ELK inhabits the northern parts of Europe. It was considered at one time to be identical with the American Elk, but naturalists now believe it to be a distinct animal. Its usual pace is a high, awkward trot, but when frightened it sometimes gallops. In Sweden it was formerly used to draw sledges, but on account of the

great facility of escape offered to criminals by its great speed, the use of it was forbidden under high penalties.



A FAMILY OF ELK.

The skin of the Elk is so tough that a regiment of soldiers was furnished with waistcoats made of its hide, which could scarcely be penetrated by a ball.

Like the Reindeer, the Elk makes a great clattering with its hoofs when in rapid motion. It is a good swimmer,

and is fond of taking to the water in summer time. It is a rather dangerous antagonist when incensed, as it fights desperately with its horns and hoofs. It has been known to destroy a wolf with a single stroke of its hoofs.

We now arrive at the *PACHYDERMATA*, or thick-skinned animals which do not chew the cud. The first on the list is the *HORSE*, an animal too well known in all its varieties to need much description. The ancients never appeared to ride on the war horse to battle, but fought from small open chariots, to which two or more horses were harnessed.

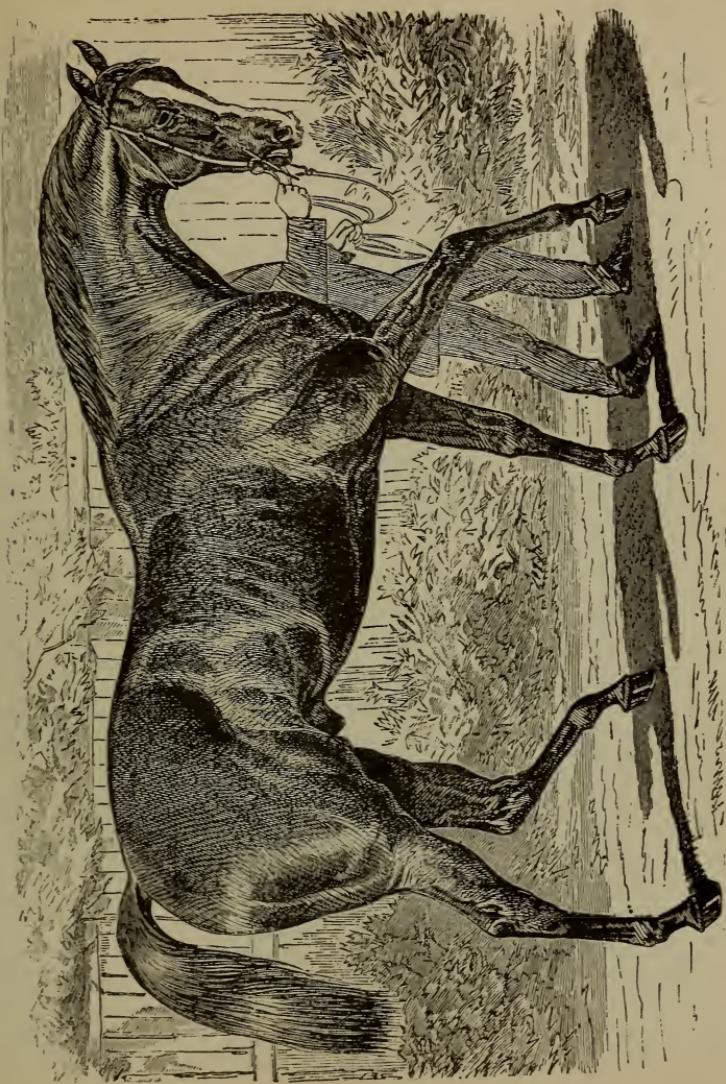
The Arabian Horse is a model of elegance and beauty. The Arab treats his horse as one of the family ; it lives in the same tent with him, eats from his hand, and sleeps among his children, who tumble about on it without the least fear. It is hard to induce the Arab to part with a favorite horse.

The plains of La Plata and Paraguay are tenanted by vast herds of wild horses. These are captured by the lasso, bitted, mounted, and broken within an hour, by the daring and skilful Guachos.

The English Horse, from which our best horses have come, has much Arabian and Barb blood in it. The race-horse is swifter for short distances than the best Arabian horse. It is much like the Arabian in looks, but is taller and longer, and has changed in color. The Arabian is generally white, light gray, or flea-bitten, but the race-horse is more usually bay and chestnut. The changes have probably come from the difference in the climate and in the way the horses are brought up. The American racehorse is descended from the English racehorse and is therefore also of Arabian blood.

The Godolphin Arabian, Flying Childers, Iroquois, and Foxhall are four of the most celebrated racers.

The fastest mile ever run by a racehorse in the United States up to 1890 was made by Salvator in one minute and thirty-five and one-half (1.35½) seconds.



RACE HORSE.

Our Trotting Horse is the fastest in the world. It is not a thoroughbred horse, or a horse of pure racing blood, like the racehorse, but is generally a descendant of a cross between the racehorse and some common breed; but a few thoroughbred racing horses have been taught to trot very fast. It is not usually as tall as the running horse, and is sometimes small. There is also a good breed of trotting horses in Russia, called Orloff trotters, which is faster than common horses, but not so fast as the American trotter. The fastest mile ever trotted in the United States up to 1894 was made at Galesburg, Illinois, by Alix in two minutes and three and three-quarter (2.03 $\frac{3}{4}$) seconds. The great pacing stallion John R. Gentry went a mile in the remarkable time of 2.01 $\frac{1}{2}$ at Glen's Falls, New York, September 10, 1896.

Draught Horses, or horses used for drawing heavy loads, are raised in many countries. In France the Percheron breed has been noted for hundreds of years. Many of them are seen in Paris, where they are used for drawing omnibuses and business wagons, and a few of them are used here. They are large, heavy horses, with large heads. In England the breeds called the Suffolk, the Cleveland Bay, and the Clydesdale are noted for their size and strength. The Flanders horse, of Belgium and Holland, is very large, heavy, and strong. Many of the great horses used by brewers are of this breed.

All these breeds are called heavy draught horses, because they are used in the heaviest kinds of trucks and large wagons. There are also light draught horses, for drawing lighter loads, which are not quite so heavy in the body and are quicker in their motions. The carriage horse is of a lighter and more elegant form than the common draught horse, but is generally large and strong. The saddle horse should be smaller than the carriage horse, graceful and active in all its movements, and taught to obey the rein and to understand every motion of its rider.



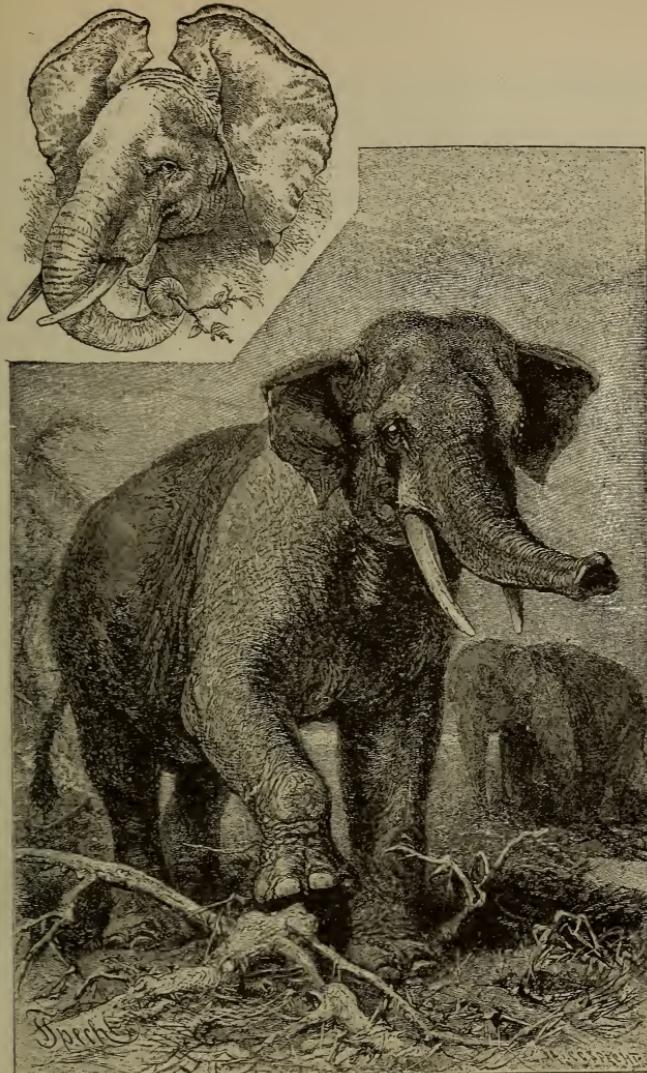
ZEBRA.

Ponies are found in many countries. Among the most noted are the Shetland ponies, raised in the islands of the same name, north of Scotland, where they are called Shelties. Some of these little horses are not much larger than a great dog, but they are very strong, and will carry a man with ease. The prairie Indians have a breed of ponies which are very hardy and strong. One of them will travel all day long with a heavy man on its back.

The humble and hardy Ass is scarcely less serviceable to man than the more imposing horse. Where it meets with harsh treatment, is scantily fed, and only used for laborious tasks, it is dull and obstinate; but in the East, where it is employed by the rich, and is properly treated, it is an elegant and spirited animal with good action and smooth coat.

The ZEBRA is found in South Africa. This beautiful animal lives in troops among the mountains, shunning the presence of man. It is distinguished by the regular stripes of brownish black with which its whole body is covered, even down to the hoofs. It is very wild and suspicious, carefully placing sentinels to look out for danger. Notwithstanding these precautions, several zebras have been taken alive, and some, in spite of their vicious habits, have been trained to draw a carriage. It could probably be domesticated like the Ass, as the black cross on the back and shoulders of the latter animal prove the affinity between them. The voice of the Zebra is peculiar and can hardly be described.

The ELEPHANT. Of this magnificent animal, whose form is familiar to every eye, two species are known, the Indian and the African. The anatomy of this huge quadruped is well worthy of consideration. Its head and tusks are so very heavy that no long neck would bear them; the neck is therefore very short. But this shortness of neck prevents the Elephant from putting its head to the ground, or from stooping to the water's edge. This apparent defect



ASIATIC ELEPHANT—INDIAN ELEPHANT.

is compensated by the wonderful manner in which its upper lip and nose are elongated, and rendered capable of drawing up water or plucking grass. In the trunk there are about 40,000 muscles, enabling it to shorten, lengthen, coil up or move in any direction this most extraordinary organ. The trunk is pierced throughout its length by two canals, through which liquids can be drawn by suction. If the Elephant wishes to drink, after drawing the liquid into its trunk, it inserts the end of its trunk into its mouth, and discharges the contents down its throat; but if it wishes to wash itself or play, it blows the contained liquid from the trunk with great violence. Through the trunk its curious trumpet-like voice is produced. At the extremity is a finger-like appendage, with which it can pick up small objects. In order to sustain the muscles of the jaw and neck, the head must be very large; were it solid, it would be very heavy. The skull is therefore formed of a number of cells of bone, forming the necessary expanse without the weight, leaving but a very small cavity for the brain.

This fact will account for the numberless bullet wounds which an elephant will endure in the skull. The ball, instead of penetrating to the brain, merely lodges among the bony cells, and does no great mischief. A ball was once found firmly imbedded in the tusk of an elephant; it was thoroughly impacted, and there was no apparent opening by which it could have reached the place that it occupied. It was found that the ball had struck the elephant at the base of the tusk, so as to have sunk among the soft and as yet unformed ivory. This by degrees was pushed on as the tusk grew in successive years, until it was at last surrounded closely by hard ivory. A spear-head has been also found similarly imbedded.

The Indian Elephant is almost invariably taken from its native haunts and then trained. The Indian hunters proceed into the woods with two trained female elephants.

These advance quietly, and so occupy the attention of any unfortunate male that they meet, that the hunters are enabled to tie his legs together and fasten him to a tree. His treacherous companions now leave him to struggle in impotent rage, until he is so subdued by hunger and fatigue that the hunters can drive him home between their two tame elephants. When once captured he is easily trained. In captivity it is very docile and gentle, but sometimes, when provoked, will take a very ample revenge. Of this propensity many anecdotes are told.

Its tusks and teeth furnish fine ivory, which is used for knife-handles, combs, billiard-balls, etc. All Elephants are fond of the water, and sometimes submerge themselves so far, that nothing but the tip of the proboscis remains above the surface. In a tame state, the Elephant delights in concealing itself below the water, and deluging the spectators with a stream sent from its trunk.

The AFRICAN ELEPHANT is distinguished from the Indian Elephant by the markings of its teeth and some difference in form, noticeably, having much larger ears.

The TAPIR forms one of the links connecting the Elephant with the Hog. The snout is lengthened into a kind of proboscis like that of the Elephant, but it is comparatively short, and has no finger-like appendage at the extremity.

It is spread throughout the warmer regions of South America. It sleeps during the day, and wanders about at night in search of its food, which consists of watermelons, gourds, and other vegetables. It is fond of the water, and can remain below the surface for a long time. It is a powerful animal, and as it is furnished with a very thick hide, it plunges through the brushwood, breaking its way through any obstacles that may oppose its progress. Its disposition is gentle, but when annoyed it rushes at its antagonist, and defends itself vigorously with its powerful teeth. The Jaguar frequently springs on it, but is often

dislodged by the activity of the Tapir, who rushes through the bushes immediately that it feels the claws of its enemy, and endeavors to brush him off against the thick branches. The height of the American Tapir is from five to six feet. The Malay Tapir is somewhat larger, and is known by the grayish white color of the loins and hind-quarters, which give the animal the appearance as if a white horse-cloth had been spread over it.

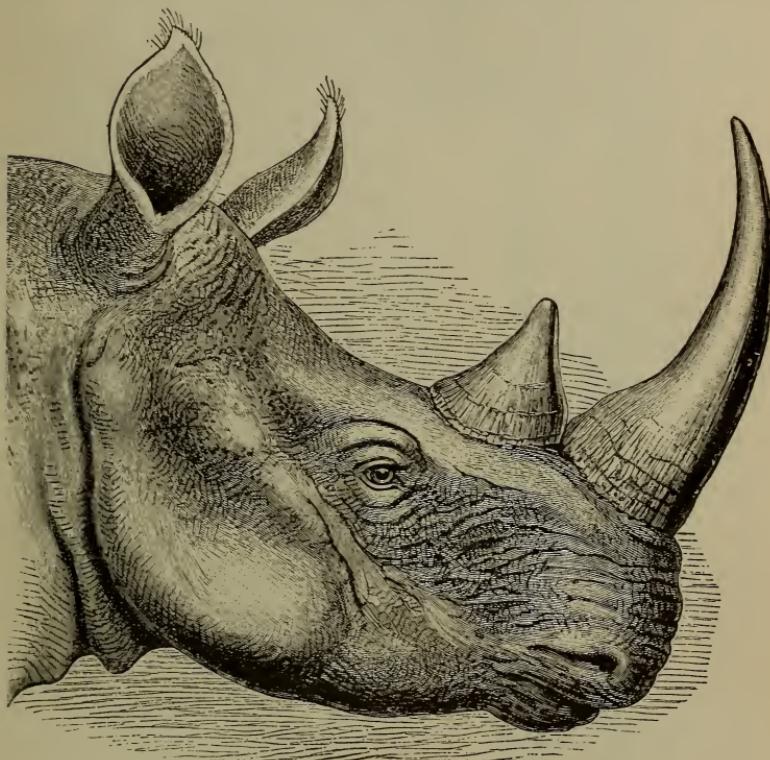
The Boar. The animals composing the Hog tribe are found in almost every part of the globe. Their feet are cloven and externally resemble those of the Ruminants, but an examination of the bones at once points out the difference.

The Wild Hog or Boar inhabits many parts of Europe, especially the forests of Germany, where its chase is a common amusement. Its tusks are terrible weapons. They curve outwards from the lower jaw, and are sometimes ten inches in length. In India, where the Boar attains to a great size, the horses on which the hunters are mounted often refuse to bring their riders within spear stroke of the infuriated animal, who has been known to kill a horse, and severely injure the rider with one sweep of its enormous tusks.

The DOMESTIC HOG scarcely needs any description. It is by no means the unclean and filthy animal that it is represented. It certainly is fond of wallowing in the mire, as are the Elephants, Tapirs, etc., but no animal seems to enjoy clean straw more than the Hog. We shut it up in a dirty, narrow crib, give it any kind of refuse to eat, and then abuse it for being a dirty animal and an unclean feeder.

The BABYROUSSA inhabits the Molucca Islands and Java. It is remarkable for possessing four tusks, two of which proceed from the upper jaw, and do not pass out between the lips, but through an aperture in the skin, half way between the end of the snout and eyes. The

sockets of the two upper tusks are curved upwards, and give a singular appearance to the skull of the animal. It looks a ferocious animal, and it is very savage and cannot



RHINOCEROS HEAD.

be hunted without danger. Yet when taken young it can be tamed without much difficulty, and conducts itself much after the manner of a well-behaved pig.

Only the male possesses the remarkable double pair of

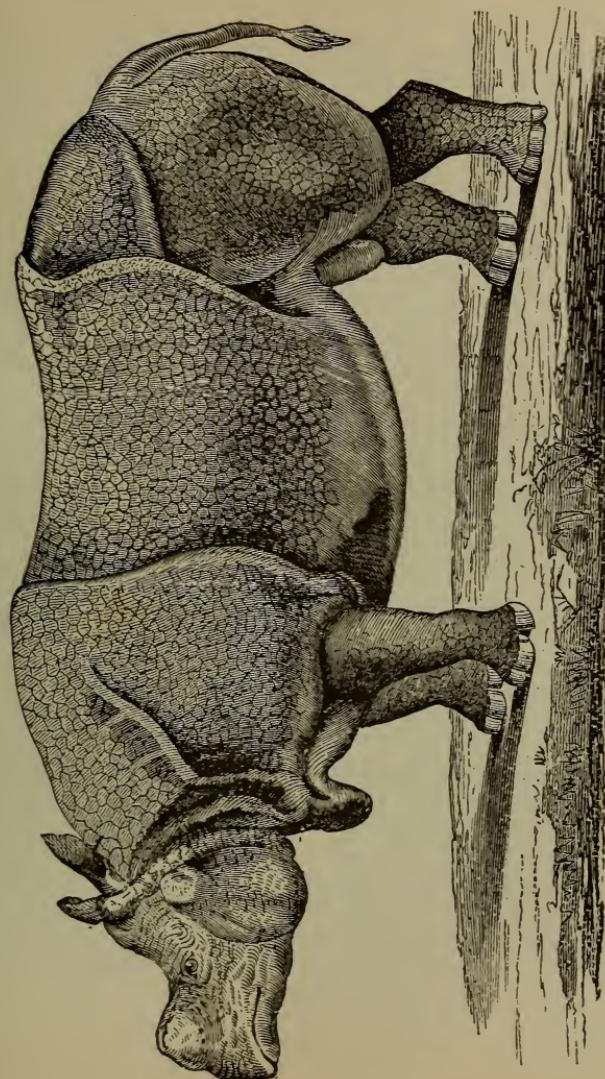
tusks, the female being destitute of the upper pair, and only possessing those belonging to the under jaw in a rudimentary degree. It lives in troops, as do most of the Hog kind, and thus does great damage to the cultivated grounds, especially to the maize, a plant to which it is very partial. It is a good swimmer, and often takes to the water in order to cross to another island. The size of the animal, when full grown, is about that of a very large Hog.

The RHINOCEROS. There are, apparently, six species of this formidable animal, inhabiting various parts of Asia and Africa. They can be distinguished from each other by the number and shape of their horns, and the color of their bodies. Their habits are much alike.

The Rhinoceros is always a surly and ill-tempered animal, and is much given to making unprovoked attacks on man and beast, if it should happen to fancy itself insulted by their presence. Their chief peculiarity, the so-called horn, is a mass of fibers matted together, and closely resembling the structure of whalebone. Their feet are divided into three toes, incased in hoofs. The horn is not connected with the skull, but is merely a growth from the skin, from which it can be separated by means of a sharp penknife. Being made of very strong materials, it is employed in the manufacture of ramrods, clubs, and other similar implements. When properly worked, it is capable of taking a very high polish, and is cut into drinking-cups.

Its organs of scent are very acute, and as the creature seems to have a peculiar faculty for detecting the presence of human beings, it is necessary for the hunters to use the greatest circumspection when they approach it, whether to avoid or to kill, as in the one case it may probably be taken with a sudden fit of fury, and charge at them, or in the other case it may take the alarm and escape.

The upper lip is used by the Rhinoceros to grasp the herbage on which it feeds, or pick up small fruit from the ground. A very tame Rhinoceros has been known to take



Great Indian Rhinoceros.

a piece of bun or biscuit from a visitor's hand by means of its flexible upper lip.

There is, probably, but one species of *HIPPOPOTAMUS*. It inhabits Africa exclusively, and is found in plenty on the banks of many rivers in that country, where it is seen gamboling and snorting at all times of the day.

These animals are quiet and inoffensive while undisturbed, but if attacked they unite to repel the invader, and have been known to tear several planks from the side of a boat and sink it. They can remain about five minutes under water, and when they emerge they make a loud and very peculiar snorting noise, which can be heard at a great distance. The hide is very thick and strong, and is chiefly used for whips. The well-known "cow-hides" are made of this material. Between the skin and flesh is a layer of fat, which is salted and eaten by the Dutch colonists of Southern Africa. When salted it is called Seacow's bacon. The flesh is also in some request.

The *Hippopotamus* feeds entirely on vegetable substances, such as grass and brushwood. The fine animal now in the London Zoological Society eats all kinds of vegetables, not disdaining roots.

From the construction of the head, the animal is enabled to raise its eyes and nostrils above the water at the same time, so that it can survey the prospect and breathe without raising more than an inch or two of its person from the water. In order to attain this object, the eyes are very small, and placed very high in the head, while the muzzle is very large, and the nostrils open on its upper surface.

Cumming relates that the track of the *Hippopotamus* may be readily distinguished from that of any other animal by a line of unbroken herbage which is left between the marks of the feet on each side, as the width of the space between the right and left legs causes the animal to place its feet so considerably apart as to make a distinct double track.



HIPPOPOTAMUS.

The teeth of the Hippopotamus are the mainstay of the dentist, who cuts from the tusk of a Hippopotamus those series of elegant teeth which replace those that age or accident has struck out of the human mouth. The ivory is exceedingly hard, and does not readily lose its beautiful whiteness, being properties which render it especially valuable for such purposes.

This is supposed by many to be the animal called Behemoth in Scripture.

The SLOTH is an example of the errors into which naturalists are led from hasty observation. The great Cuvier himself condemns the Sloth as a degraded and miserable animal, moving with pain, and misshapen in form. Yet no animal is more fitted for its position than the Sloth. In its wild state it spends its whole life in the trees, and never leaves them but through force or accident, and, what is more extraordinary, not upon the branches, like the Squirrel and Monkey, but under them. He moves suspended from the branch, he rests suspended from the branch and he sleeps suspended from the branch.

To render it fit for this singular mode of life, its long and powerful arms are furnished with strong, curved claws, which hook round the branches and keep the animal suspended without any effort. When on the ground these claws are very inconvenient, and it can barely shuffle along; but when it is among its native branches it moves with exceeding rapidity, particularly in a gale of wind, when it passes from branch to branch, and from tree to tree, with an activity which its movements on the ground by no means portend.

The PANGOLINS are known by the peculiar, strong, horny plates with which their bodies are defended, giving them the appearance of animals enveloped in a suit of scale armor. When attacked they roll themselves up, wrap their tails round them, and raise the whole array of sharp-edged scales with which their body is covered, and bid



THE GREAT ANT-EATER.

defiance to almost any enemy except man. They live on ants and termites, or white ants, as they are called, which they take by thrusting their long, slender tongue among the ants, which adhere to it by a gummy saliva. When the tongue is covered it is rapidly retracted, and the ants swallowed. To obtain the ants, the Pangolins are furnished with powerful claws to tear down the dwellings of their prey. The long-tailed species is widely scattered through Africa, but is not very common. The length of its body is about two feet, and that of its tail rather more than three. The short-tailed is common in India. Its entire length is about four feet.

The ARMADILLOS live exclusively in the warmer parts of South and Central America. They eat carrion, insects, and sometimes fallen fruit. They burrow with great rapidity, and can only be forced from their refuge by smoke or water. When hunted and close pressed they endeavor to escape by rapidly burrowing into the earth, or try to oppose a partial resistance by rolling themselves up and trusting to the protection of their armor. The natives and colonists consider them great delicacies when roasted in their shells.

The curious ANT-EATER inhabits Guiana, Brazil and Paraguay, and lives principally upon ants and termites, which it procures in precisely the same manner as was related of the Pangolins. Its short legs and long claws would lead an observer to suppose that its pace was slow and constrained, but when chased it runs off with a peculiar trot, and with such rapidity that it keeps a horse to its speed to overtake it.

Its tongue looks exactly like a great red worm, and when the creature is engaged in devouring its food, the rapid coiling and twisting of the tongue add in no small degree to the resemblance.

The claws are very long and curved, and are exceedingly strong. They are placed on the foot in such a manner



DUCK-BILL.

that when the animal is walking its weight rests on the outside of the fore-feet and the outer edge of the claws, which make a great clattering if the Ant-eater is walking upon a hard surface.

When it sleeps it lies on one side, rolls itself up, so that its snout rests on its breast, places all its feet together, and covers itself with its bushy tail. The fur of the animal resembles hay, and when it is thus curled up in sleep it is so exactly like a bundle of hay that anyone might pass it carelessly, imagining it to be nothing but a loose heap of that substance. Its ordinary length is about forty-three inches, and its height about three feet.

The DUCK-BILLED PLATYPUS. Australia, where everything seems to be reversed, where the north wind is warm and the south wind cold, the thick end of a pear is next the stem, and the stone of a cherry grows outside, is the residence of this most extraordinary animal. When it was first introduced into Europe it was fully believed to be the manufacture of some impostor, who with much ingenuity had fixed the beak of a duck into the head of some unknown animal. It will, however, be seen by the skull of the animal that this duck-like beak really belongs to the animal, and is caused by a prolongation of some of the bones of the head.

It lives by the banks of rivers, in which it burrows like the Water-rat. Curiously enough, it finds no difficulty in this labor, for the feet are so constructed that the animal can fold back the web at pleasure, and thus the foot is enabled to perform its task. It feeds upon water insects and shell-fish, always rejecting the crushed shells after swallowing the inhabitant. The male has a sharp spur on its hind-feet.

The learned have given the animal several names. The native name for the creature is "Mullingong."

BIRDS.

BIRDS are distinguished from the Mammalia by their general form, their feathery covering, and by producing their young inclosed in eggs.

The different orders of birds are principally known by the character of the claws and beak. Before attending to individual species, we will first examine some of the structures common to all birds.

One of the first great marks of distinction in birds is the wing. This organ is a modification of the arm or fore-limb of mammalia, clothed with feathers instead of hair.

The bones of adult birds are not filled with marrow like the bones of mammalia, but are hollow and filled with air, and are therefore rendered very light, a bone of a goose being barely half the weight of a rabbit's bone of the same size, after the marrow has been extracted. The bones forming the wing are beautifully jointed together, and arranged so as to give great strength together with lightness. Most persons seem to fancy that the foot of the bird is that part which grasps the branch, or by means of which it walks on the ground—that the joint above that member is the knee—and that the thigh is the feathered portion of the limb that proceeds from the bird's body. These ideas are all wrong.

The leg of a bird is formed on much the same principle as the hind-leg of a quadruped, the part that grasps the branches being composed of the *toes*, the so-called knee-joint being the heel-bone of the foot, so that the whole foot reaches half way from the perch to the bird. The

knee-joint is placed high up against the body, and is buried in the feathers.

As the wing presents a very broad surface to the air, it is necessary that very powerful muscles should be used to move it with sufficient rapidity. The pectoral muscles are therefore enormously developed, extending almost the whole length of the body, as every one who has carved a fowl must have seen, and in order to form an attachment for these immense muscles, the ridge of the breast-bone is equally enlarged. It is the want of these enlarged muscles that prevents man from flying, even when he has attached wings to his arms. The principal characteristics of birds are taken from their foot and beak.

The fuller and more technical description of the Birds runs as follows. They are vertebrate animals, but do not suckle their young. The young are not produced in an actively animated state, but enclosed in the egg, from which they do not emerge until they have been warmed into independent life by the effects of constant warmth. Generally, the eggs are hatched by means of the natural warmth which proceeds from the mother-bird; but in some instances, such as that of the *Tallegalla* of Australia, the eggs are placed in a vast heap of dead leaves and grass, and developed by means of the heat which is exhaled from decaying vegetable substances.

The number of existing species of birds being in all probability considerably over ten thousand, it will be obvious that the various groups must be treated briefly; and in many instances we shall be able to allude only to the families, without referring to the genera, and in some cases not even the whole of the former are mentioned.

The *LAMMERGEYER*, or *BEARDED VULTURE*, inhabits most mountain ranges, and is very common in the Alps of Switzerland and Germany, where, from its depredations on the kids and lambs, it has earned its name of *Lämmergeyer*.



1, BLACK VULTURE; 2, EGYPTIAN VULTURE; 3, GRIFFON VULTURE.

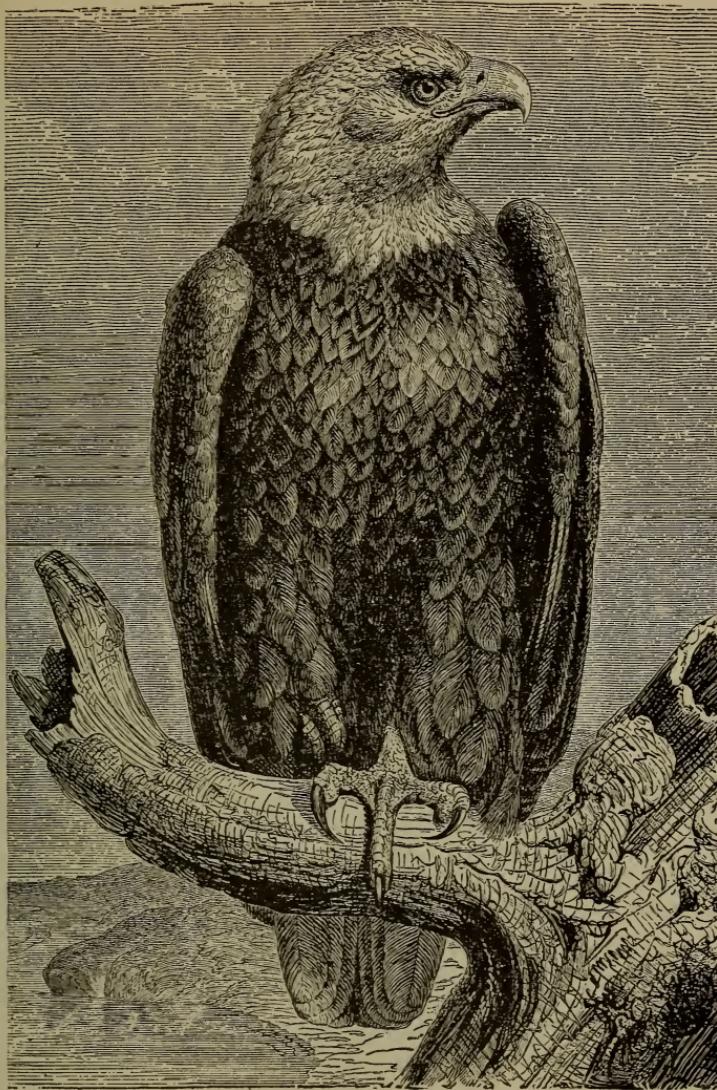
Although called the Bearded "Vulture," it is not strictly a vulture, as its head and neck are feathered, and it rejects putrid flesh, unless hard pressed by hunger.

It destroys hares and young or sickly sheep and goats, nor, when rendered fierce by hunger, does it fear to attack the adult chamois, or even man. It is said to destroy the larger animals by watching until they are near the brink of a precipice, and suddenly driving them over the rocks by an unexpected swoop. In this manner the strong and swift chamois falls a victim to the craft of its winged foe, and instances are not wanting where the chamois-hunter himself has been struck from a narrow ridge into the valley beneath by a blow from this ferocious bird. It is exceedingly bold, and shows but little fear of man.

The name of "Bearded" Vulture is given to it on account of the long tuft of hairs with which each nostril is clothed. The length of its body is about four feet, and the expanse of its wings from nine to ten. It lays two eggs.

The CONDOR inhabits the Andes of South America, always choosing its residence on the summit of a solitary rock. This bird does not build any nest, but lays its two white eggs on the bare rock after the manner of many sea birds. The expanse of wing is about ten feet, and the length of the bird about three feet. It is exceedingly strong and tenacious of life. Two Condors will attack and kill the llama; for by repeated buffeting and pecking they weary it so completely that it yields to their perseverance.

The true VULTURES are the representatives of the carrion-devouring animals, such as the Hyenas, Wild Dogs, etc. They, however, do not attack living animals. The neck of the Vulture is almost naked, very slightly sprinkled with down, and, from the formation of the lower part of the neck, the bird is enabled to draw its head almost under the feathers of its shoulders, so that a hasty observer would conclude that the creature had no neck at all.



WHITE-HEADED SEA-EAGLE.

The marvellous quickness with which the Vultures discover a dead animal has caused many discussions among naturalists as to the sense employed; some declaring entirely for sight, and others asserting that the scent of putrid animal matter leads the Vultures to their prey.

The probability is that both senses are used, one aiding the other. Where a dead hog was hidden under canes and briars numbers of Vultures were seen sailing in all directions over the spot, evidently directed by the scent, but unable to discover by their eyes the exact position of the animal. The olfactory nerves of the Vulture are beautifully developed.

The GRIFFON VULTURE is found in almost all parts of the old world. It is one of the largest of its group, measuring upwards of four feet in length. Like most of the Vultures, it does not appear to move its wings while flying, but soars in large circles.

Vultures are generally protected by the natives of the countries where they reside on account of their great utility in clearing away putrid animal matter.

They seem to hold the same place among birds as the Hyenas among the Mammalia.

EAGLES are characterized by hooked beaks and sharp, powerful claws. About seventy species are known. They have great powers of flight and of vision, are diurnal and solitary in their habits, and use their claws in killing their prey. The Eagle was regarded by the ancients as a symbol of royalty, and has the proverbial distinction of being the king of birds. Large specimens of the Eagle measure three and a half feet in length, and nine feet from tip to tip of the expanded wings. These birds usually breed in mountainous districts or forests, remote from human habitations. They are all monogamous, and it is said that a pair will live together in perfect harmony until death separates them. They build their nests on a high tree, a ledge of rock, or on some inaccessible cliff. The nest is inar-

tistically constructed of sticks, which are rudely arranged. The Eagle is supposed to live to a great age, more than one hundred years.

The Golden Eagle is a magnificent bird found in Europe, Asia and North America, deriving its name from the golden-red color of the feathers which cover its head and neck. The plumage of the body is a rich dark-brown. This species is the largest of the European Eagles. It feeds on hares, lambs, pigs, fish, etc., which it carries to its nest. When in pursuit of its prey it is very audacious, and has been seen to carry off a hare before the noses of a pack of hounds.

It is stated that the Golden Eagle can be tamed, and has been trained to catch game for its master. Its flight is graceful. It sweeps through the air in a series of spiral curves, rising with every spire, and making no perceptible effort or motion with its wings. To keep the sunshine above from teasing it, the eye is put under a triangular pent-house, which is the most characteristic thing in the bird's whole aspect. The Imperial Eagle, which inhabits Asia and Southern Europe, is nearly as large as the Golden Eagle, and is similar in appearance. Its head and neck are covered with feathers of a deep fawn-color. It generally builds on lofty trees.

The national bird of the United States is the Bald Eagle, which has a white head, neck and tail. Its length is about forty inches, the stretch of wing about eight feet. The nest of the Bald Eagle is generally made upon some lofty tree, and sometimes becomes of great size, as the bird is in the habit of using the same nest year after year, and making additions to it every season. The female bird generally lays her eggs in January, two or three in number, and they are hatched by the middle of February. It is strongly attached to its young, and will not forsake them, even if the tree on which they rest be enveloped in flames. It is fond of fish, which it generally steals from the osprey.

Its habit is to watch near a river until an osprey has caught a fish, which the Eagle snatches in the air or catches as it falls from the claws of the osprey. It is widely distributed through different regions of North America, and frequents the sea-coasts, lakes and large rivers.

The Harpy Eagle is a fierce and powerful bird of Mexico and of Central and South America. A single stroke of its bill has been known to break a man's skull.

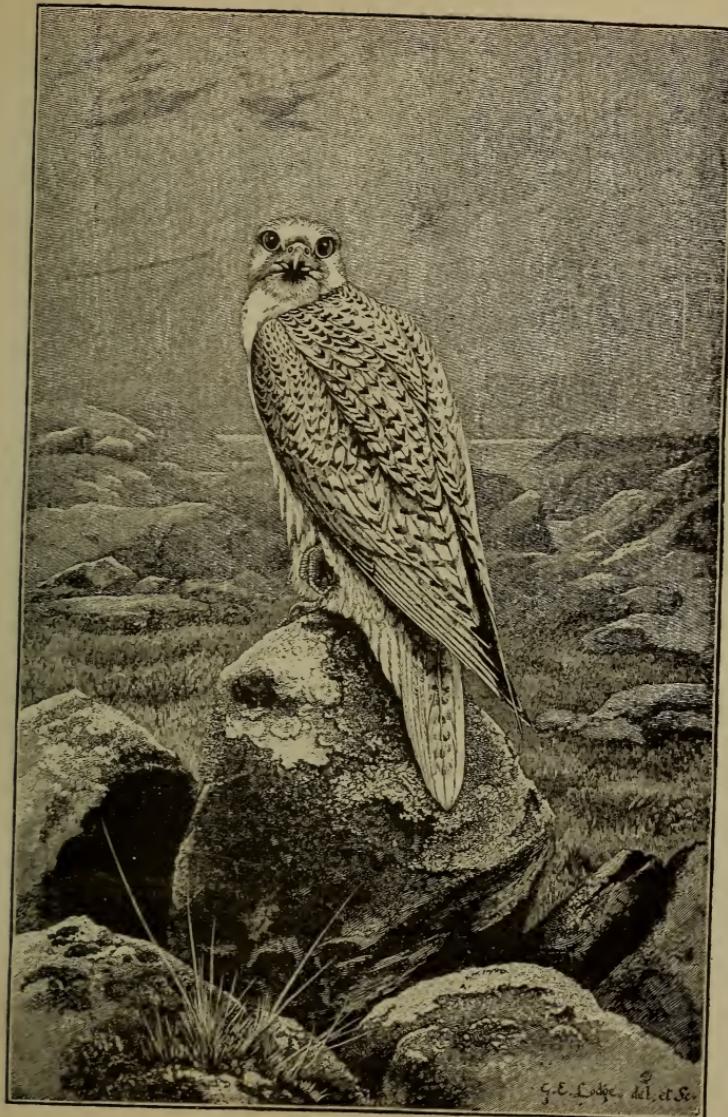
The BUZZARDS are distinguished by their short beaks, large, rounded wings and squared tails. They all live on small animals, reptiles and various insects. The Common Buzzard occurs throughout most of Europe and part of Asia. When searching for food it rests upon some high branch, waiting until some small animal makes its appearance, when it sweeps down from its elevation, seizes its prey without settling on the ground, and returns, if not disturbed, to the same spot.

It generally builds in high trees, but has been known to make its nest among rocks. Its eggs are usually three in number. Its length is about twenty-two inches.

The KITE, GLEDE, or GLED is spread over Europe, Asia and Northern Africa. It is hated by the farmer for its depredations on his poultry, and its appearance is the signal for a general outcry among the terrified poultry, who perceive it long before the keenest-eyed man can distinguish it from a casual spot in the distant sky. The sportsman detests it for the havoc it makes among the game.

It builds in tall trees and lays three eggs. Its length is rather more than two feet.

The PEREGRINE FALCON, an inhabitant of most parts of Europe, Asia and South America, was in the palmy days of hawking one of the favorite Falcons chosen for that sport. Its strength and swiftness are very great, enabling it to strike down its prey with great ease; indeed, it has been known to disable five partridges in succession. From



G. E. Lodge, del. et Sc.

THE GREENLAND FALCON.

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its successful pursuit of ducks it is sometimes called the Duck Hawk.

Instead of merely dashing at its prey, and grasping it with its claws, the Peregrine Falcon strikes its victim with its breast, and actually stuns it with the violence of the blow before seizing it with its claws. The boldness of the Peregrine is so great that it was generally employed to take the formidable Heron. After the Heron had been roused by some marsh, the Falcon, who had previously been held hooded on its master's hand, was loosed from its bonds and cast off. A contest then took place, each striving to ascend above the other. In this contest the Falcon was always victorious, and after it had attained a sufficient altitude it swept, or "stooped," as the phrase was, upon the Heron. When the Falcon had closed with its prey they both came to the ground together, and the sportsman's business was to reach the place and assist the Falcon in vanquishing its prey. Sometimes, however, the wary Heron contrived to receive its enemy on the point of its sharp beak, and transfixed it by its own impetus.

It changes the color of its plumage several times before it arrives at full maturity, and in the days of falconry was known by different names, such as "haggard," when wild, "eyeass," "red falcon," when young, "tiercel" or "tassel-gentle," when a full-grown male. It builds on ledges of rocks, laying four eggs, and its length is about 18 inches.

The KESTREL, or WINDHOVÉR, as it is often called, frequently falls a victim to the mistaken zeal of the farmer, who takes every opportunity of destroying it, as he confounds it with the sparrow-hawk. The natural food of the Kestrel is field-mice, so that the farmer should protect instead of murdering his benefactor. These birds are not uncommon. Their nest is usually built in the deserted mansion of a crow or magpie. The eggs are four in number. The length is about fifteen inches.

The SPARROW-HAWK is common throughout Europe.

It displays great pertinacity in pursuit of its prey, which it will chase for a long while, skimming along a few feet above the ground. One of these hawks was known to dash through a window in pursuit of a small bird. When taken young it is easily tamed. Its length is about fifteen inches. It builds upon lofty trees, laying five eggs.

The SECRETARY BIRD derives its name from the tufts of feathers at the back of its head, which bear a fanciful resemblance to pens stuck behind the ear. This extraordinary bird inhabits South Africa, Senegambia and the Philippine Islands. Probably a different species inhabit each of these countries. It feeds on snakes and other reptiles, of which it consumes an amazing number, and is on that account protected. When battling with a snake it covers itself with one wing, as with a shield, and with the other strikes at the reptile until it falls senseless, when a powerful blow from the beak splits the snake's head asunder, and the vanquished enemy is speedily swallowed. In the crop of a dissected Secretary Bird were found eleven large lizards, three serpents, each a yard in length, eleven small tortoises and a great quantity of locusts and other insects. It is easily tamed, and is then exceedingly useful. It builds on high trees, laying three large eggs. Its length is about three feet.

OWLS. A large round head, with enormous eyes looking forward, is a distinguishing mark of the owl family. Many species possess two feathery tufts placed on the head, greatly resembling horns. The Owls are nocturnal birds, pursuing their prey by night and sleeping during the day. Their eyes are enormously large, and capable of taking in every ray of light. Their power of vision is also increased by the method in which the eye is fixed in a kind of bony socket, just like a watchmaker's glass. The power of hearing is very delicate, and greatly assists them. In order to protect them from the cold, they have a dense covering of downy feathers, which also prevent

the movements of the wing from being heard by the wary mouse; and so noiseless is their flight that they seem to be borne along by the wind like a tuft of thistledown.

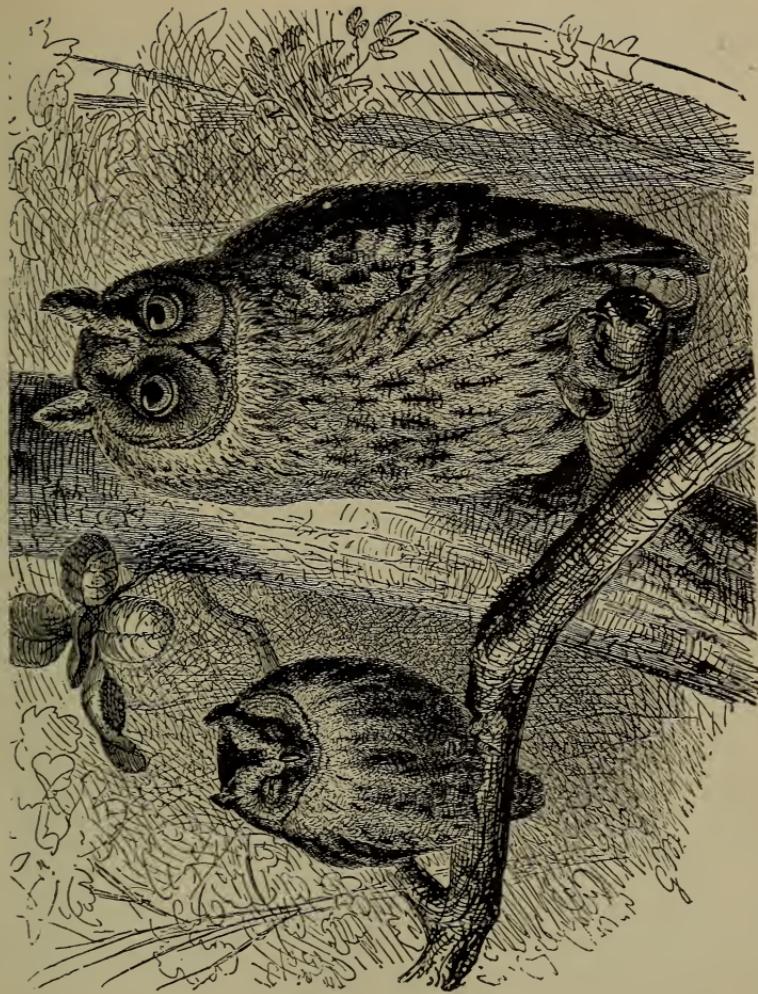
The SNOWY OWL is properly an inhabitant of the north of Europe, but is also found in North America. It is a good fisher, snatching its prey from the water by a sudden grasp of the foot. It also preys on lemmings, hares, ptarmigans, etc., chasing and striking at them with its feet. It makes its nest on the ground, and lays three or four white eggs, of which more than two are seldom hatched. Its length is about two feet, and its expanse of wing is four feet.

The GREAT-EARED OWL, or EAGLE OWL, is the largest of the family. This powerful bird boldly attacks young fawns, hares and rabbits, together with small birds. It inhabits the north of Europe, but has been several times observed in England. It lays its eggs in the clefts of rocks or in ruined buildings. Its length is upwards of two feet.

The BARN OWL affords another instance of mistaken persecution. This useful bird, whose carcass we so often see triumphantly nailed to the barn, actually feeds upon and destroys the rats and mice which bear it company in its undeserved punishment.

Few people know what a little bird this owl really is. The thick, loose plumage is so deceptive that no one would imagine that it is hardly so large as a pigeon. The head, when stripped of its feathers, loses its previous aspect, being long and narrow, like that of a hawk.

Its domestic habits are very curious. When irritated or alarmed, it snaps its beak loudly, and makes a hissing sound, something like that of a cat when provoked. There is something very cat-like in the whole aspect of the Owl —its round, soft-looking face, in which are set two great eyes that shine in the dusk of the evening, and are capable of taking in every feeble ray of light, and its noiseless movements in pursuit of its prey.



SCOPS OWL AND LONG-EARED OWL.

If a mouse be given to an owl, the bird seizes it across the back and gives it one or two smart bites, much as a terrier handles a rat. The mouse is then jerked upwards, and caught again head downwards. A second jerk sends the mouse half down the owl's throat, while its tail remains sticking out of the side of its bill, where it is rolled about as if the owl were smoking. After some time has been spent in this amusement, another jerk causes the mouse to disappear altogether, and the owl looks very happy and contented. But if a small bird is presented to it, the owl tears it up and devours it piecemeal.

The Barn Owl lays three or four eggs upon a mass of those pellets which all the owls disgorge. There is a rough, chalky look about the eggs of the owl, which renders them different from the eggs of all other birds, from which they can be distinguished by the touch alone. There is a peculiarity in the domestic economy of this owl, for it often has at the same time in the same nest young owls almost fledged, and eggs on which the hen bird is sitting.

The length of the bird is rather more than twelve inches. Its color is a bright yellowish-brown, marked with dots and lines of various tints, the lines being generally dark and the dots light. When attacked it throws itself on its back and fights vigorously with its claws and bill.

The NIGHT-JAR, or GOAT-SUCKER, sometimes called the FERN OWL, is spread over Europe. It may be seen at the approach of evening, silently wheeling round the trees, capturing the nocturnal moths and beetles; then occasionally settling and uttering its jarring cry. When flying, the bird sometimes makes its wings meet over its back, and brings them together with a smart snap. It makes no nest, but lays two mottled eggs on the bare ground. Its length is ten inches. The Whip-poor-Will belongs to this family.

The SWIFT is the largest and swiftest of the Swallows.

It spends the whole day on the wing, wheeling with wonderful velocity, and occasionally soaring until it is hardly perceptible, but screaming so shrilly that the sound is plainly heard. The number of insects which it destroys is almost incredible; they are retained in a kind of pouch under the tongue, and, when taken out, can hardly be pressed into a tea-spoon. They are intended for the young, and the supply is constantly renewed. It lays from two to four long white eggs, on a nest composed of grass, straw, feathers, silk, etc. The color of this bird is a dusky black. The length is eight inches, the expanse of wing eighteen inches, and its weight barely *one ounce*.

The foot of the Swift is of a singular form, unlike that of any other bird. All the toes are directed forward, there being no hinder toe at all. Some naturalists say that the object of this formation is that the bird may be enabled to climb up the eaves under which its nest is made.

The CHIMNEY MARTIN is the commonest of its family. When skimming over ponds or rivers in search of insects the snap with which it closes its bill may easily be heard. In its flight it often dashes up the water with its wings, which action gave rise to the opinion that Swallows passed the winter under water, and rose in the spring. It is so eager after its prey that it may easily be caught with a rod and line baited with a fly.

It breeds twice in the year, building a nest of mud against any convenient situation, and lays five eggs. The bird appears to return, year by year, to its old nest. The whole of its upper surface is a deep purplish-black, its forehead and throat chestnut.

Humboldt relates that he saw a swallow perch on the rigging of the vessel when it was 120 miles from the land.

The SAND MARTIN is the smallest of the Swallows, but makes its appearance before any of its brethren. It builds in cliffs of sandstone, boring holes three feet in depth, and often winding in their course, probably to

avoid a casual stone or spot too hard for its bill, which, although small and apparently unfitted for the task, makes its way through the sandstone with great rapidity. Where a convenient sand-cliff exists, hundreds of these pretty little birds may be seen working away at their habitations, or dashing about in the air, looking at a distance like white butterflies, and occasionally returning to the rock, which is often completely honeycombed by their labors.

The HOUSE MARTIN follows a little after the Swallow, and almost invariably takes possession of its old nest, which it repairs about May. It lays five eggs, closely resembling those of the Sand Martin. About September, immense numbers may be seen perched upon houses and trees preparatory to their departure.

The ESCULENT SWALLOW, whose nests are considered such a delicacy among the Chinese, builds its singular habitation in the sides of almost inaccessible cliffs, so that the business of procuring them is a most dangerous task. The nature of the jelly-like, transparent material of which the nests are made is not yet known. The nests are chiefly found in Java.

The magnificent family of the TROGONS stands pre-eminent in beauty and brilliancy of plumage, the usual tint being a metallic golden-green, boldly contrasted with scarlet, black and brown. The toes are placed two behind and two before, like those of the Woodpeckers.

The RESPLENDENT TROGON is the most gorgeous of the family. Its long and gracefully-curved tail, nearly three feet long, the whole of the upper surface and the throat are a glowing green; the breast and under parts are bright crimson; the middle feathers of the tail black and the outer feathers white. This splendid bird is an inhabitant of Mexico, and was used by the Mexican nobles as an ornament to their head-dress.

From its feathers the mosaic pictures of the Mexicans

were made. It is a very difficult bird to stuff, on account of the delicate texture of the skin, which is so fragile that it tears almost as easily as wet blotting paper.



THE KINGFISHER.

KINGFISHERS are distinguished from other birds by the peculiarities of their form.

The common Kingfisher is found in most parts of England. Scarcely anything more beautiful can be conceived than the metallic glitter of its plumage as it shoots along the banks of the river, or darts into the water after its struggling prey. Its usual method of fishing is by placing itself on a stump or stone overhanging the water, from which spot it watches for the unsuspecting fish beneath. After a fish is caught the bird kills it by beating it several times against its resting place and then swallowing it head foremost.

It lays its eggs in holes bored in the banks of rivers or ponds, and appears to build no nest. A pair of Kingfishers, for two successive years, inhabited a bank of a very small stream, little more than a drain, where no fish lived, nor were there any to be found within a considerable distance.

The eggs are from four to seven in number, of a pearly whiteness, and remarkably globular in shape.

The HOOPOE is one of the most elegant birds. Its beautiful crest can be raised or depressed at pleasure, but is seldom displayed unless the bird is excited from some cause. Its food consists of insects, which it first batters and molds into an oblong mass, and then swallows with a peculiar jerk of the head.

They are very common in France, and may be seen examining old and rotten stumps for the insects that congregate in such places. There they may be seen in flocks, but they never seem to go over to England in greater numbers than one pair at a time. A curious account is given of the attitude assumed by the Hoopoe on perceiving a large bird in the air. "As soon as they perceived a raven, or even a pigeon, they were on their bellies in the twinkling of an eye, their wings stretched out by the side of the head, so that the large quill feathers touched the head, leaning on the back with the bill pointing upwards. In this curious posture they might be taken for an old rag!"



HUMMING-BIRD AND NEST.

The Hoopoe lays from four to seven gray eggs in the hollow of a tree. Its length is one foot.

The HUMMING-BIRD. These little living gems are exclusively found in the New World, especially about the tropical parts, becoming gradually scarcer as we recede from the tropics in either direction. Only two species are known to exist in the northern parts, but in the central portions and in the islands about Florida they absolutely swarm. They glance about in the sunshine, looking like streaks of brilliant light; and so rapid is the vibration of their fine and elastic wings that when hovering over a flower a humming or buzzing sound is produced, from which peculiarity the name of Humming-Bird has been given them in almost every language. Waterton's description is very characteristic. "Though least in size, the glittering mantle of the Humming-Bird entitles it to the first place in the list of the birds of the New World. It may truly be called the Bird of Paradise; and had it existed in the Old World it would have claimed the title instead of the bird which has now the honor to bear it. See it darting through the air almost as quick as thought! now it is within a yard of your face—in an instant gone—now it flutters from flower to flow to sip the silver dew—it is now a ruby—now a topaz—now an emerald—now all burnished gold."

Its tongue is formed much like that of the Woodpecker, being curled round the head, under the skin, and thus capable of being darted to a considerable distance.

Like many other little creatures, it is remarkable for its assurance and impudence. It is easily tamed for that very reason, and has been known to domesticate itself in an hour from the time of its capture, and even when released it has returned again to partake of the dainties which it had tasted during its captivity.

There are an immense number of species of these exquisite birds, varying from the size of a Swift to that of a

Humble-Bee. The nests are neat and beautiful, and, as may be imagined, exceedingly small. They are composed of down, cotton, etc., and are sometimes covered on the outside with mosses and lichens.

The CREEPERS are remarkable for their long, slender bills and claws, adapted for climbing trees and capturing insects. The common Creeper may often be seen running spirally up the trunks of trees, and probing the bark with its bill; and so firmly do the claws hold that when shot it does not always fall, but remains clinging to the tree. Its nest is made in a decayed tree. The eggs are from seven to nine in number.

The WREN shares with the robin some immunity from juvenile sportsmen. Although it may be fearlessly hopping about in the hedge, jerking its funny little tail, and playing its antics just at the muzzle of the gun, few boys will fire at it—a privilege for which it is difficult to give a reason, except, perhaps, the assertion that "The robin and the wren are God's cock and hen;" and although why these two quarrelsome birds should be selected it is difficult to say. Perhaps the Robin enjoys his immunity from the "Babes in the Wood," and the Wren makes a convenient rhyme.

The nest of the Wren is built in any convenient cranny; any ivy-covered tree, the thatch of a barn, or a warm scare-crow, are all used by this fearless little bird. The nest is usually of an oven-shape, always covered on the outside with some material resembling the color of the objects round it, such as green moss if built among ivy, or brown lichen if built on a rock or in the fork of a withered branch. The eggs are six or eight in number.

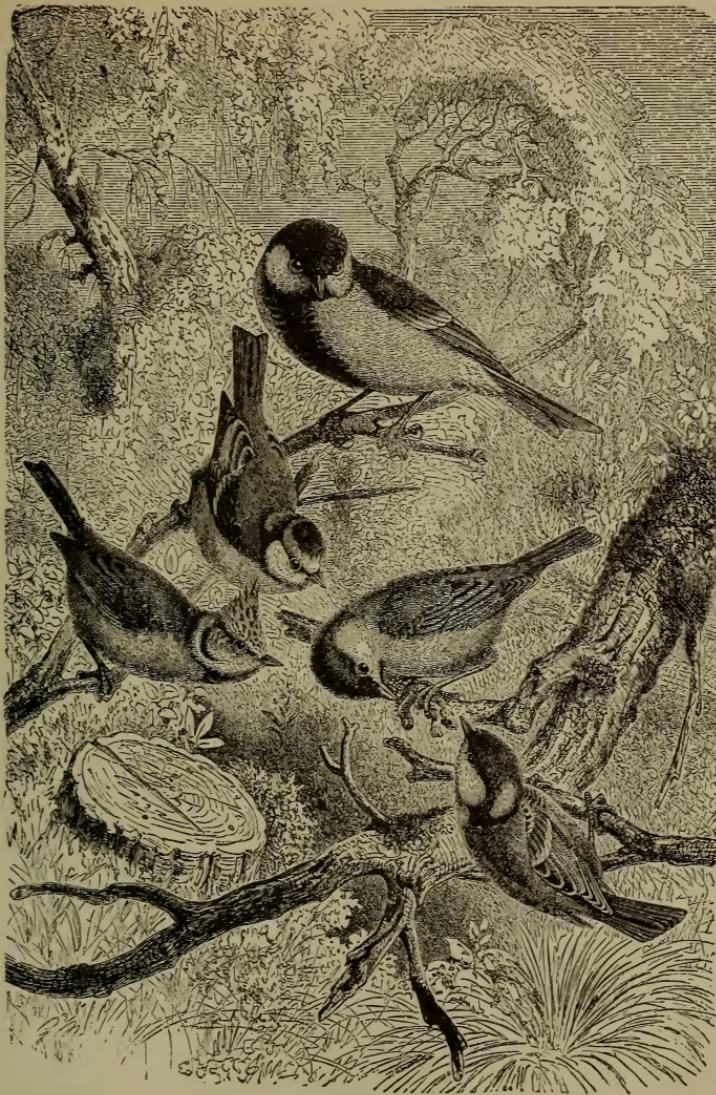
The NIGHTINGALE. The wild and spiritual melody of its marvelous notes sounds comparatively weak unless backed by the accompaniments of night and tranquillity; for its inimitable song loses great part of its beauty when uttered by day, deadened and confused with other sounds.

In many counties of England its sweet and almost nightly strains are frequently heard. The fields and college gardens of Oxford are full of Nightingales. The male is the vocalist.

The WARBLERS are spread over almost the entire globe. The BLACKCAP, almost a rival of the Nightingale, is recognized by the black color of the crown of the head. Only the males are decorated, the crown of the head of the female being dark brown. Its sweet notes are poured forth from the concealment of some thicket or tuft of trees, where it trusts to the density of the foliage to elude discovery. Like the American Mocking-Bird, it can imitate the songs of other birds with such perfect inflection that it is almost impossible to detect the imposture. Among bushes and brambles it builds its nest, which is made of dried grass, moss and hairs. The eggs are five in number. Its length is nearly six inches.

The GOLDEN-CRESTED REGULUS is one of the smallest of British birds. Fir plantations are its favorite resort, and there it may be seen hopping about the branches, or running round them, head downwards, in search of the insects hidden beneath the bark. Its name is derived from the orange-colored tuft of feathers on the crown of its head, for which reason it is often called the Kinglet. Its note is weak, but very pleasing, and much resembles that of the common Wren. The female is very bold while sitting, and will permit close observation without quitting the nest. The nest itself is an object of great beauty. It is usually placed on the under side of a fir branch, sheltered by the overhanging foliage, and sometimes further protected by a large bunch of cones forming a kind of roof over it. The eggs are from six to ten in number. Its length is over three inches.

The REDBREAST, or ROBIN REDBREAST, as it is termed, has, by its fearless conduct, earned itself golden opinions from all kinds of men. Every nation seems to protect it;



GROUP OF TITS.

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and it lives unharmed, possibly on account of its oft-told charity towards the Babes in the Wood.

In the Winter, when the berries are gone, insects dead, and the worms hidden under the hard, frozen soil, then the Robin flies for refuge to the habitations of man for shelter and food. It is very amusing to see the half-trusting, half-fearful look with which it hops to the window-sill for the first time. After a while it becomes bold, and taps at the window, if the expected crumbs are not thrown out. Before very long it ventures to enter the room, hops about on the table, and quite seems to consider as a right what was first merely a favor. When once established it is very jealous, and will not suffer a friend to be partaker of the same comforts, but attacks him with the greatest fury; so the unfortunate second comer has to wait shivering outside the window, with his feathers puffed up, and his little eyes glancing from the depths of his plumage.

The nest of this bird is built in the crevice of an old ivied wall, in a bank, sheltered by the roots of a tree, or in a mass of ivy clinging to an old tree. The eggs are five in number.

The birds of the family of the TITS are remarkable for their active habits. There are few who have not seen these interesting little birds twisting round the branches, perfectly unconcerned at the presence of the spectator, sometimes hanging head downwards, sometimes chasing an unlucky beetle along the bark, and invariably catching it, in spite of its swift limbs and active wings; sometimes twisting off a bud, and pulling it to pieces with marvelous rapidity, in order to secure the lurking caterpillar within; sometimes pecking away at a piece of loose bark, and extracting an unwilling spider by one of its legs left incautiously projecting from its lurking-place.

The little BLUE TITMOUSE is well known. It is most amusingly courageous, and from the strenuous resistance it offers to its capturer, has acquired from rustic boys the

name of "Billy-biter." The angry hiss of the female has frequently caused an intruding hand to be rapidly withdrawn, for the sound is so like the hiss of a snake, and the little beak is so sharp, that few have the courage to proceed with their investigations. A pair of these birds built their nest in the coping of a railway station in England, not two feet from the fiery and noisy engines, which were constantly passing. The men respected the courage of the little birds, and this whole brood was hatched and suffered to fly at liberty.

The utter contempt which this bird entertains for fire-arms often leads to its destruction, for when the schoolboy has been wasting his powder and shot in attempting to hit larks and such large game, he consoles himself by shooting the unfortunate Titmouse, who will allow him to come so close that few vestiges of it remain except a tuft of blue feathers.

It lays from six to eight eggs. Its length is about four and a half inches.

The WAGTAILS, so named from the almost incessant vibration of their tails, are exclusively confined to the Old World. The PIED WAGTAIL is the most common of its race. We often see it pass rapidly, with its peculiar dipping flight; it settles on the ground and wags its tail; it runs a few paces, and wags its tail again: pecks at an insect, and its tail vibrates. It does not hop, like the Warblers, Finches, etc., but runs with great rapidity, and altogether looks very like a diminutive Magpie. Sand-banks by the sides of rivers are the usual resort of these birds, where they may almost always be seen, running about by the water's edge, sometimes snatching at an incautious May-fly, sometimes wading into the water after a caddus-worm or a stray grub, or pecking at a little minnow, which has come too near the surface—and then it flies off to another spot to repeat the same manœuvres. This bird also greatly frequents pastures, and may be seen running

about among the cows in the most nonchalant manner imaginable, catching the flies that torment those animals in the summer, or flying off to its unfinished nest with a beak full of hairs. Their nests are built near the water, in crevices among stones, or in the hole of a wall. Frequently when stones are piled by a wet quarry, several nests may be found in one heap of stones. The eggs are four or five in number. Its length is over seven inches.

The WATER OUZEL, or DIPPER, is found principally in hilly places where there are clear and rapid streams. There it may be seen to go through its far-famed movements under the water, which have given rise to so much controversy. It dives for considerable distances with apparent ease, and has a habit of dipping and rising repeatedly, from which practice its name has been derived.

The nest is usually built by the water-side, and is carefully concealed. In appearance it is not unlike that of the Wren, being made of intertwined mosses, with an entrance at the side. It lays five largish eggs, of a pure white. Its length is about seven inches.

The SONG-THRUSH, THROSTLE, or MAVIS, is deservedly considered one of our best singing-birds. Its powerful and rich notes may be heard in January, when most of the other singing birds are either silent or have departed. Its nest is built almost before any other bird has commenced, and may often be seen conspicuously placed in a bush some time before the leaves have begun to sprout. In order to defend the callow young from the cold winds of the season when they are hatched, the nest is more substantial than birds are accustomed to build, being thickly plastered within with a coating of mud, effectually keeping out the chilly blasts. Were it only for its singing powers, the Thrush would deserve protection; but the services it renders to the gardener in devouring insects, snails and other destructive creatures, entitle it to a double share of regard.

It is amusing to watch a Thrush listening for the sound of the earth-worm working his way through the ground, or the gnawing teeth of the cockchaffer grub. The grub he unearths and devours without further ceremony, but he knows that if he is not cautious, the earth-worm will withdraw itself out of his reach. He therefore gives several hops near the worm, which, fancying that it hears its enemy the mole pursuing it, comes to the surface, and is instantly seized in triumph by the crafty thrush.

It clears the shells from snails by beating them against a stone, and when it has found a place for that purpose, it returns to the same spot with its prey, so that heaps of broken snail-shells may often be found where the Thrushes have been at work.

The eggs of the Thrush are five in number, of a bluish-green color, spotted with deep reddish brown. Sometimes the spots are absent.

The BLACKBIRD is a delightful songster, whose jetty hue and orange-tawny bill are well-known. It is a very shy bird, and if disturbed in a hedge, has a habit of darting through it, and then escaping on the other side, uttering a sharp cry of alarm. Its habits are like those of the Thrush, especially in its zeal for unearthing the cockchaffer grubs, and possibly for eating cherries when they are ripe.

Its nest is built usually at the foot of a hedge, frequently in the very centre of a holly bush, safe from most enemies, except weasles and school-boys.

The eggs are five in number, of a bluish-green color, spotted with brown.

The MOCKING-BIRD is a native of most parts of America. This wonderful bird stands pre-eminent in powers of song. Not only are its natural notes bold and spirited, but it has the faculty of imitating with deceptive fidelity every sound it hears. To its flexible organs, the harsh setting of a saw, the song of a Nightingale, the creaking of a wheel, the whistled tune of a passer-by, the full and mel-

low notes of the Thrush, the barking of a dog, the crowing of a cock, and the savage scream of the Bald Eagle, are each equally easy of execution, and follow one another with such marvellous rapidity that few can believe that the insignificant brown bird before them is the sole author of these varied sounds. The Virginian Nightingale and the Canary hear their exquisite modulations performed with such superior execution that the vanquished songsters are silent from mere mortification, while the triumphant Mocking-Bird only redoubles his efforts. Wilson in describing this bird says: "His expanded wings and tail glistening with white, and the buoyant gayety of his action arresting the eye, as his song does most irresistibly the ear, he sweeps round with ecstasy, and mounts and descends as his song swells or dies away. He often deceives the sportsman, and sends him in search of birds that are not perhaps within miles of him, but whose notes he exactly imitates; even birds themselves are frequently imposed upon by this admirable mimic, and are decoyed by the fancied calls of their mates, or dive with precipitation into the depth of thickets at the scream of what they suppose to be the Sparrow-hawk."

While sitting on its eggs it is an exceedingly courageous bird, attacking without discrimination man, dogs, or any animal who may approach too near the nest. But the black snake is the special object of its vengeance. The snake, who has perhaps just arrived at the vicinity of the nest, and is contemplating a pleasant breakfast on the young or eggs, is violently attacked by the enraged Mocking-Bird, who, by repeated blows on the head, generally destroys its enemy, and then, mounting on a bush, pours forth a triumphant song of victory.

The nest is made generally in a bush or apple-tree, frequently close to houses, as the bird is protected by the inhabitants. The Mocking-Bird is often kept tame, in which case, so far from its imitative powers showing any decrease,



MOCKING-BIRD.

the variety of domestic sounds heard about the house is often perplexing.

The SPOTTED FLYCATCHER may be considered as the type of the entire family. It may be seen in gardens and orchards, going through the evolutions that have given it its name. From some elevated spot it watches for a passing insect, on seeing which it darts from its post, secures the insect in the air, and returns to the same spot by a short circular flight. It is not a timid bird, and will permit an observer to stand quite close to it, provided that he does not disturb it. Its note is a weak chirp, and even that is not often heard.

The nest is built usually in holes of trees or walls, or sometimes between a branch of a wall fruit-tree and the wall itself. The eggs are five in number. Its length is about five inches.

The SHRIKE or BUTCHER-BIRDS well deserve their name, as they live upon insects and small birds, which they kill, and afterwards transfix with a thorn, preparatory to devouring them. They take their prey much after the same manner as the Flycatchers, by darting on it from some place of concealment.

The GREAT GRAY SHRIKE feeds upon mice, birds, frogs and other small animals. After pouncing upon its prey, the Shrike, by a few blows on the head from its powerful bill, destroys it. It is then carried to the nearest hedge, impaled on a thorn, and the Shrike devours it at his leisure. Large insects are treated in the same manner. The object of this impalement is apparently that the creatures thus suspended should become tender or "high." The bird, after hanging a lizard or a mouse in this fashion, generally goes off and fetches another, always preferring to eat those which have remained longest on the thorn, and which are, as it were, cooked in the sun.

There is a strong bodily resemblance between this Shrike and the Mocking-Bird, the distinction lying gener-

ally in the outline ; while the plumage is so similar, that many persons have actually confused the two birds, giving to the one the habits of the other. Moreover, the resemblance is not merely in outward form ; the Gray Shrike can also imitate the notes of other birds, and often does so.

The name *Excubitor*, or *Sentinel*, is given it from its habit of watching for birds of prey, and chattering loudly directly it perceives them, thereby proving that, like most other tyrants, it has a great objection to suffering any injury itself.

The nest is built on trees, and contains about six eggs. Its length is about ten inches.

The *JAY*, so well known for the beautiful blue markings on its wings, is rather a shy bird, preferring to reside in the thickest woods, and seldom coming into the open country. It is easily tamed when young, and is very amusing when domesticated.

It possesses great talents for mimicry. It has been known to imitate the sound of a saw, the bleat of a lamb and the neighing of a horse with the most perfect accuracy. Although its natural voice is harsh and grating, yet it can imitate the sweet notes of singing birds, such as the Greenfinch, with wonderful fidelity. It has also frequently been taught to articulate words.

The name of *Glandarius* has been given to the *Jay*, because it feeds on vegetable productions, such as acorns, etc., more than the true *Crows*. It is also partial to fruits, especially ripe cherries. It is also said to devour eggs and young birds.

Its nest is built about twenty feet from the ground, the upper part of a thick bush being preferred. The eggs are five or six in number. Its length is nearly 14 inches.

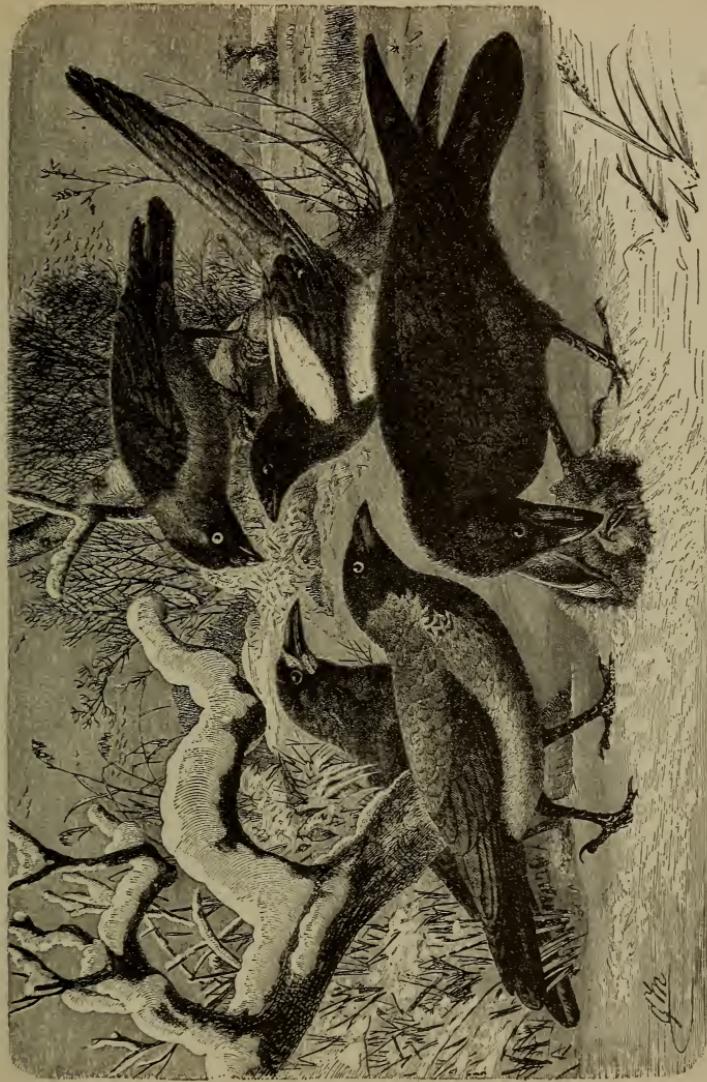
The *MAGPIE* seems to rival the *Parrot* in the proud title of the *Monkey of the Birds* (the *Raven* being the ornithological baboon). Its thieving and hiding propensities are proverbial.

Its nest is built on a high tree, and curiously defended with thorns, having a small hole just large enough to admit the owners, so that the liberal use of a pocket-knife is frequently requisite in order to obtain the eggs. The nest is covered with a dome of thorns, and its interior is defended by a coating of mud, worked smooth. The eggs are five in number. Its length is about eighteen inches.

The RAVEN is very common in Europe, Asia and America, but is now seldom seen except in a domesticated state. It is frequently found in the Hebrides. In those islands it lives principally on carrion of various kinds, such as a dead sheep or lamb, whose death the Raven is accused with some justice of hastening, and on fishes or cetaceous animals which have been cast on shore by the waves. In these cases the Raven conducts itself much in the manner of the Vulture. It commences by taking out the eye and tongue, and then proceeds to tear open the abdomen, operations for which its sharp and powerful bill seems quite as well fitted as the hooked beak of the rapacious birds. It is a very crafty bird, and can with difficulty be approached; but by laying a dead carcass near its haunts, and being carefully concealed, it may be seen cautiously approaching; first, perching on an eminence, it looks carefully round; then advancing with a sidelong step, examines its expected prey. When fully satisfied, it pecks out the eyes, and proceeds to satiate itself with food. The Raven seems to revel in storms, and to be deterred by no inclemency of weather from seeking its prey.

Although formerly so plentiful that innumerable omens were drawn from its appearance, its croaking, or its flight, it has almost become extinct.

A Raven used to watch a gardener taking particular pains to prop up and secure a valuable plant. His labor was always in vain, for the Raven, with a sidelong step and an unconcerned air, as if he were thinking of anything but the plant, would sidle by it, when one wrench of his



1, JACKDAW; 2, ROOK; 3, GRAY CROW; 4, MAGPIE; 5, RAVEN.

iron bill laid the plant on the earth, and the Raven moved off with an air of innocence. The lady to whom the garden belonged was quite afraid of the bird, and declared that she almost believed that it was possessed by some evil spirit. It used to walk behind her, so that she could never see it, for when she turned round, the Raven hopped round too, and kept himself completely out of her sight. At last it became so very mischievous that it was sent away.

It has a great capacity for imitating sounds, and can be taught to pronounce whole sentences, or sing songs with wonderful accuracy.

In the northern parts of Scotland it makes its nest on high rocks, but not unfrequently builds on the summit of a tall tree. The nest is a large, irregular structure of heath, grass, wool and feathers, and sea-weed, if it builds near the shore. It lays from four to seven eggs. Its length is 26 inches, and the expanse of wing nearly 60 inches.

The Rook inhabits almost every part of Europe, and is very common in England, where it lives in a kind of semi-domestication, usually inhabiting a grove of trees near a house, or in a park, where it is protected by the owner, although he makes it pay for this accommodation by shooting the young ones every year. Apparently in consequence of this annual persecution, the Rook has an intense horror of guns, perceiving them at a great distance. While feeding in flocks in the fields, or following the plowman in his course, and devouring the worms and grubs turned up by the share, the Rook has always a sentinel planted in a neighboring tree, who instantly gives the alarm at the sight of a gun, or other suspicious-looking object.

The good which the Rook does by devouring the grubs of the cockchaffer and the tipulus, or daddy-long-legs, both of which are exceedingly injurious to the crops, more than compensates for the damage it sometimes causes by pulling up young corn, or newly-set potato cuttings; in the latter case more, I believe, to get at the wireworms, which

crowd to slices of potato, than to eat the vegetable itself. In the fruit season, the Rook, like most other birds, likes to have his share of the cherries, pears and walnuts, but may be easily kept away by the occasional sight of a gun.

Towards evening the Rooks may be seen flying in long lines to their resting-place. They then perform sundry evolutions in the air, and finally settle to rest.

Round the base of the Rook's beak is a whitish-looking skin, denuded of feathers, the reason or cause of which is not very obvious. A white variety of the Rook is sometimes seen.

The eggs of the bird are five in number. Its length is nineteen inches.

The JACKDAW is a well-known bird. It does not build in the branches of trees like the rook, but prefers holes in decayed trees or old buildings, particularly frequenting church-towers and steeples. The Jackdaw feeds upon almost any substance that it can find. It kills mice with a single blow of its beak, and then devours them piece-meal. Grasshoppers, beetles, etc., are also killed by a squeeze across the thorax, and the head, wings and legs are twisted off before the bird begins to eat them. It treats bees, wasps and other stinged insects with much more caution. The feathers upon the crown of its head are of a grayish-white color, a peculiarity instantly distinguishing it from the Rook. It is frequently kept tame, and is very amusing in captivity.

The eggs are of a lighter color than those of the Rook, smaller and more sparingly spotted. Its length is fourteen inches.

The CROW, or CARRION CROW, as it is erroneously called, seldom feeds on carrion; for poor indeed would be his meals were he dependent on dead sheep or horses for a livelihood. Possibly the name was given as a distinction between it and the Rook. Waterton states that the flesh

of the Carrion Crow is just as good as that of the Rook, and relates how he once served up a pie of these birds to some friends, who thought them pigeons. It will also eat cherries and walnuts like the Rook, and when the supply of insects has failed, it will then turn its attention to the duck-pond or farm-yard, and carry off a young duckling or chicken.

It also carries off eggs, by pouncing upon them, and driving its bill through the shell, and even mice and rats are not unaccustomed food.

The nests of this bird are placed on the summit of some tall tree, and contain about five eggs. Its length is nineteen inches.

The CHOUGH is rather larger than the Jackdaw, and is principally distinguished by the red hue of its bill and legs. It inhabits the counties of the western coast of England. When tame, it shows a very inquisitive disposition, examining every novelty with the greatest attention. It builds its nest in the cavities of high cliffs, and lays four or five eggs. Its length is seventeen inches.

The EMERALD BIRD of PARADISE.—This most gorgeous and elegant bird was once the subject of much discussion between naturalists. The natives of New Guinea were accustomed to dry them, having first cut off their legs, and then to offer them for sale. In this footless state they reached Europe, where it was universally stated that the bird lived always in the air, buoyed up by the lightness of its feathery covering; that the shoulders were used as its nest; that the only rest it took was by suspending itself from a branch by the filamentary feathers of the tail; that its food was the morning dew; together with many other conjectures not less ingenious than amusing.

This bird is about the size of a Jay. Its body, breast and lower parts are of a deep rich brown, the front set close with black feathers shot with green; the throat is of a rich golden green; the head yellow; the sides of the



EMERALD BIRD OF PARADISE. KING BIRD OF PARADISE.

tail are clothed with a splendid plume of long, downy feathers, of a soft yellow color. By these are placed two long filamentous shafts, which extend nearly two feet in length.

Of these beautiful feathers the bird is so proud that it will not suffer the least speck of dirt to remain upon them, and it is constantly examining its plumage to see that there are no spots on it. When in its wild state, it always flies and sits with its face to the wind, lest its elegant filthy plumes should be disarranged.

So far from living exclusively on dew, it eats no small amount of insects, such as grasshoppers, which it will not touch if dead, and commences its repast by stripping off the legs and wings. When in confinement, it also eats boiled rice, plantains and other vegetables; but in the wild state it seems to feed mostly on the seeds of the teak-tree, and a kind of fig. There are several species of Paradise Birds.

The BALTIMORE ORIOLE is an inhabitant of the whole of Northern America, its range extending from Canada to Mexico—even as far south as Brazil.

It is a migratory bird, arriving about the beginning of May, and departing towards the beginning of September. The name of Baltimore Oriole has been given to it because its colors of black and orange are those of the arms belonging to Lord Baltimore, to whom Maryland formerly belonged. This species is remarkably familiar and fearless of man, hanging its beautiful pensile nest upon the garden trees, and even venturing into the streets wherever a green tree flourishes, and chanting its wild, mellow notes in close proximity to the sounds and sights of a populous city.

The nest of the Baltimore Oriole is most ingeniously woven. The materials of which this beautiful habitation is made are flax, various kinds of vegetable fibres, wool and hair, matted together, so as to resemble felt in consist-

ency. A number of long horse-hairs are passed completely through the fibres, sewing it firmly together with large and irregular but strong and judiciously-placed stitching. In one of these nests Wilson found that several of the hairs used for this purpose measured two feet in length. The nest is in the form of a long purse, and at the bottom is arranged a heap of soft cow's-hair and similar substances, in which the eggs find a warm resting-place. The female bird seems to be the chief architect, receiving a constant supply of materials from her mate, and occasionally rejecting the fibres or hairs which he may bring, and sending him off for another load better to her taste.

Since the advent of civilization, the Baltimore Oriole has availed himself largely of his advantages, and instead of troubling himself with a painful search after individual hairs, wherewith to sew his hammock together, keeps a look-out for any bits of stray thread that may be thrown away by human sempstresses, and makes use of them in the place of the hairs. So sharp-sighted is the bird, and so quick are his movements, that during the bleaching season the owners of the thread are forced to keep a constant watch upon their property as it lies upon the grass or hangs upon the boughs, knowing that the Oriole is ever ready to pounce upon such valuable material, and straightway to weave it into his nest. Pieces of loose string, skeins of silk, or even the bands with which young grafts are tied, are equally sought by this ingenious bird, and often purloined, to the discomfiture of the needlewoman or the gardener. The average size of the nest is six or seven inches in depth, and three or four in diameter. Wilson thinks that the bird improves in nest-building by practice, and that the best specimens of architecture are the work of the oldest birds. Its food seems to be almost entirely of an animal nature, and to consist of caterpillars, beetles and other insects, most of them injurious to the farmer.

The coloring of this bird is as follows: The head and

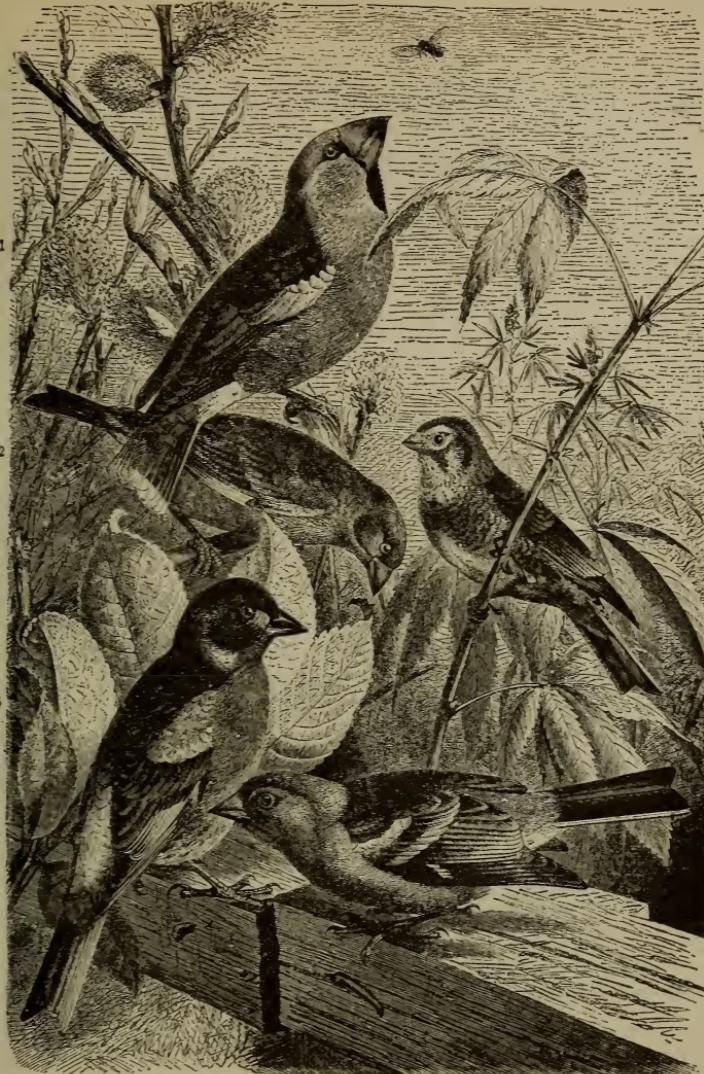
throat, together with the upper part of the back and the wings, are deep black, with the exception of an orange bar upon the shoulders. The lower part of the back and the whole of the under surface are bright orange, warming into scarlet on the breast. The tail is rather curiously colored. The female is dull black upon the upper parts and mottled with brownish yellow, each feather being marked with that tint upon the edges. The lower part of the back and all the under portions of the body are dull orange, and the tail is mostly olive yellow. The wings are dull brown, and marked with yellowish white upon the coverts.

From these colors the bird has derived the names of Golden Robin and Fire Bird. Its total length is about seven inches.

The COMMON STARLING is well-known both for its beauty and its singular method of flight. When a flock of Starlings begin to settle for the night they wheel round the place selected with great accuracy. Suddenly, as if by word of command, the whole flock turn their sides to the spectator, and, with a great whirring of wings, the whole front and shape of the flock is altered. No body of soldiers could be better wheeled or countermarched than are these flocks of Starlings.

It lives principally among old buildings, and is very fond of gaining admittance into dovecotes, where it is a harmless visitor, and may be suffered to remain without detriment to the pigeons or their eggs. Its nest is made usually in a hole in a wall, sometimes in a decayed tree, and contains five eggs of a very delicate, uniformly pale blue.

There is never any difficulty in discovering the nest of the Starling, for if it builds in a hole of a wall it generally leaves several straws sticking out, as if to indicate the locality; and when it goes to take food to its young, both parent and children set up such an outcry that it may be



1, HAWFINCH; 2, GREENFINCH; 3, LINNET; 4, BRAMBLING;
5, CHAFFINCH.

heard a long way off. Consequently, there are few eggs so prevalent in the string of the country boy as those of the Starling.

We now arrive at the very large and interesting family of Finches. None of the species are large, and most of them are excellent songsters. Their beaks are conical, and fitted for the destruction of corn, peas, etc.

The GROSBEAK, or HAWFINCH, well deserves its generic name of "Berry-breaker," for its beak is capable of breaking the hard kernels of the cherry, and even those of the olive. It is not a very rare bird, although it is but seldom seen. This fact is accounted for by its great shyness and dread of mankind. It seldom ventures out of the thick woods in which it delights to dwell.

The nest of this bird is very shallow, and slightly put together, being hardly superior to that of the Wood-pigeon. The eggs are from four to six in number. Its length is seven inches.

The CHAFFINCH, or PIEFINCH, as it is often called, is chiefly remarkable for the beautiful nest which it constructs. The forks of a thorn or wild crab-tree are favorite places for the nest, which is composed of mosses, hair, wool and feathers, covered on the exterior with lichen and mosses, so exactly resembling the bough on which the nest is placed that the eye is often deceived by its appearance. In the nest four or five very pretty eggs are laid.

The name Cœlebs; or Bachelor, is given to this bird, because the females quit the country about November, leaving large flocks of males behind them.

The GOLDFINCH, or THISTLEFINCH, so called on account of its fondness for the down of the thistle, is one of our most beautiful birds. Where thistles abound, small flocks of Goldfinches may be seen flying from hedge to hedge, and occasionally pecking the white tops of the thistles. The tufted seed of the dandelion, groundsel and other plants is also eaten by the Goldfinch.

In captivity it is very tame, and can be trained to perform a multitude of tricks, the most common of which are drawing its own food and water with a chain and bucket, or firing a gun when commanded. The nest is very beautiful, being mostly made of wool and down from various plants, and is usually placed on the extremity of a spray. The eggs are small, of a whitish tint, spotted with orange brown.

The COMMON LINNET frequents commons and neglected pastures. Its song is very sweet, and many bird-fanciers suppose that the mixed breed of a Canary and a Linnet has a sweeter song than either bird.

Its nest is usually built in the centre of a large and dense bush ; the eggs are five in number.

The CANARY. This pretty little songster is so well known as to need but little description, particularly as there are no opportunities of studying its natural course of life. From the manner in which the Canary is usually reared it is evident that the bird has but very little opportunity of exhibiting its natural instincts.

The courageous, impudent, quarrelsome SPARROW is known to all. There are few who have not seen this little bird, when pressed by the cold in the winter, come to the window, expecting his donation of crumbs. It is very fond of grain of various kinds, and does some damage to the farmer, but the destruction of caterpillars by the bird more than compensates for the loss of the grain. The little impudent bird has no scruple in perching on the pig's trough and partaking of his dinner, or in mixing with fowl and taking its share of their provisions ; and on a newly-thatched house it absolutely revels. Dozens of Sparrows may then be seen pecking and pulling at the straws in high enjoyment. The nest of the House Sparrow is usually built in holes of roofs. The eggs are speckled black and white and very variable.

The YELLOW-HAMMER or YELLOW BUNTING is a very

delicately-marked little bird, very common in hedges, where it flits before the traveller, always keeping about twenty yards in front. It makes its nest on the ground and lays five eggs curiously scribbled over with dark chocolate lines, as if a child had been trying to write Arabic on the eggs.

The LARKS are known by their very long hind toe. The Skylark, which pours forth its animated song while suspended high in the air, is an inhabitant of most parts of Europe, Asia and North Africa, but is not found in America. A story is told of a Skylark that was brought to America by an emigrant, and which used to collect crowds of delighted listeners round its cage. An English settler, who happened to be passing by while the bird was singing, was so affected by the reminiscences which its song called up that he offered his horse and cart for the bird on the spot. The bird afterwards passed into other hands, but refused to sing until its cage was hung up in the open air.

The nest is made on the ground, frequently in the print of a horse's foot, and contains five eggs. There are generally two broods in the year: one in May and the other in July or August. Immense numbers of these birds are caught annually and sent to the London markets. The mode of catching the Larks is generally by means of a number of horsehair nooses attached to a long line. Food is scattered among the nooses, and the Larks in reaching the food get their limbs entangled in the horsehair, and either strangle themselves or are held until the fowler comes to take them out.

The BULLFINCH affords a singular instance of the power of art on the song of birds. The natural note of the Bullfinch is low, and can only be heard at a short distance; but when well trained the bird whistles, or "pipes," as it is called, any melody which has been taught it in a fine flute-like tone. A good piping Bullfinch sells at a very high price. The method of teaching is to confine the



BLACK LARK, WHITE-WINGED LARK, AND SHORT-TAILED LARK.

birds in a dark room, and, before their food is given, to play the air that they have to learn on an instrument called a bird-organ. The birds soon begin to imitate the notes, and by degrees the whole tune is learned. Some trainers substitute a small clarionet for the bird-organ.

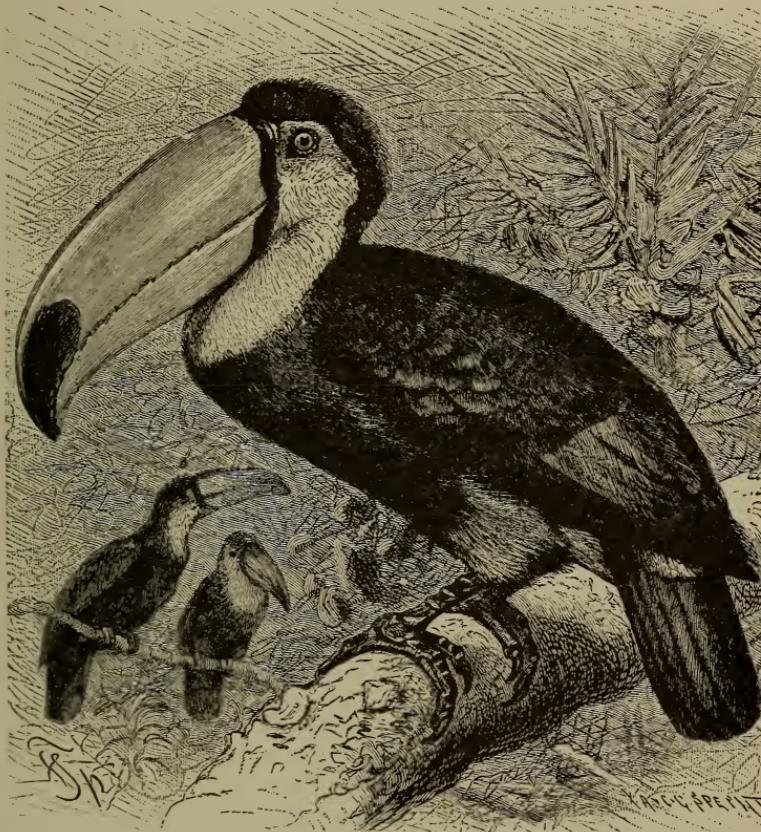
When in captivity the Bullfinch is very sociable, and soon learns to know his owners, and to come to them when called. Its nest is made in thick bushes or fir-trees. The eggs are of a pale greenish-white, spotted with orange brown. The name of Bullfinch is given to it on account of the large proportionate size of its head and neck. When in captivity, its plumage sometimes turns black, the result of feeding it too profusely with hemp-seed.

The RHINOCEROS HORNBILL. This singular and almost startling family comprises but few species, which are all natives of India and Africa. The enormous bill, with its incomprehensible appendage, although of course heavy, is really much lighter than it looks, being composed of a kind of light honey-combed structure. The upper protuberance is hollow, and it is supposed to serve as a sounding-board to increase the reverberations of the air while the bird is uttering its peculiar roaring cry.

In spite of the apparently unwieldy bill the bird is very active, and hops about the branches of the trees with much ease. The appendage to the upper mandible is small when the bird is young, and only attains its enormous size when the Hornbill has reached its full growth. The bill of the Hoopoes presents a somewhat analogous peculiarity, as when the bird is young the bill is short and pointed, and increases with the size of the bird. From this circumstance naturalists imagine that there is an affinity between the Hornbills and Hoopoes.

The Hornbills seem to be omnivorous, fruits, eggs, birds, reptiles, etc., forming their food. The African Hornbills are extremely fond of nutmegs, and are, on that account, said to be peculiarly delicate eating.

The Rhinoceros Hornbill is a native of India and the Indian islands. The length of its bill is usually about ten inches.



TOUCAN.

The CLIMBING BIRDS now engage our attention. Under this order are placed Toucans, Parrots, Woodpeckers and

Cuckoos. The feet of these birds have two toes in front and two behind.

The TOUCANS are natives of South America. Their enormous bill is light, being chiefly composed of a honey-comb structure. It seems to be very sensitive and well-supplied with nerves, as the bird not only appears to enjoy holding meat or fruits with the tip of its bill, but has been seen to scratch that organ with its foot, plainly proving that there must be sensation. It seems to be omnivorous, but is particularly fond of mice and small birds, which it kills by a powerful squeeze, then strips, and finally pulls to pieces and devours, having previously reduced them to a shapeless mass by repeated lateral wrenches with its enormous and saw-like bill.

When sleeping the Toucan takes great care of its bill, packing it away and covering it carefully with the feathers of its back, and altogether presents the appearance of a large round ball of feathers. The body is about eighteen inches in length. These birds, together with the Hoopoes and Hornbills, have a habit of throwing their food down their throats with a peculiar jerk of the bill.

In the MACAW family the construction of the bill is very remarkable. As the curved tip of the bill would prevent the bird from opening it wide enough to admit its food, the upper mandible is united to the skull by a kind of hinge-joint, of equal strength and flexibility. When climbing among the branches of trees, or about their cages, the Parrots invariably make great use of their hooked bills in assisting themselves both in ascending and descending. The Cross-Bills have been observed to climb in much the same way.

The Parrots are said to be very long lived; some have certainly been known to live upwards of eighty years in captivity, and may be imagined to exceed that period in a wild state. The Macaws are natives of South America. The blue and yellow Macaw inhabits the countries of

Brazil, Guiana and Surinam, living principally on the banks of rivers.

The RINGED PARRAKEET is frequently seen domesticated, where its pleasing manners and gentle disposition render it a favorite. It seems to be fond of ripe walnuts, divided in halves; and while it is picking out the kernel continually utters a short clucking sound indicative of pleasure.

It soon learns to repeat words and short sentences, and to speak with tolerable distinctness. Sometimes, when excited, it utters most ear-piercing screams, and always appears to practice any new accomplishment when it thinks no one is within hearing.

The color of the bird is green, and a rose-colored band round its neck gives it the name of the Rose-ringed Parakeet. The bill is red.

The COCKATOOS are remarkable for the powdery surface of their wings, and the crest on the head, which can be raised or depressed at pleasure. The Sulphur-crested Cockatoo is an inhabitant of New Guinea. Its color is white, and the crest is of a sulphur yellow. Its white plumage glancing among the dense dark foliage of its native forests, imparts a wonderful beauty to the scene. This Cockatoo is easily tamed, and is of a very affectionate disposition. When in captivity it has been known to live to the age of 120 years. Its nest is built in hollow trees and the crevices of rocks. The eggs are white. Its length is about eighteen inches.

The WOODPECKERS, whose name indicates their habits, are widely spread, being found in all quarters of the globe, except Australia. They subsist on insects and grubs, which they dig out of trees or discover under the bark. For this purpose their whole structure is admirably adapted. The bill is long, sharp and powerful, and the formation of the feet and legs is such that the bird can grasp the tree firmly with the feet, while swinging with the force of his whole body against it. Another most singular point in the

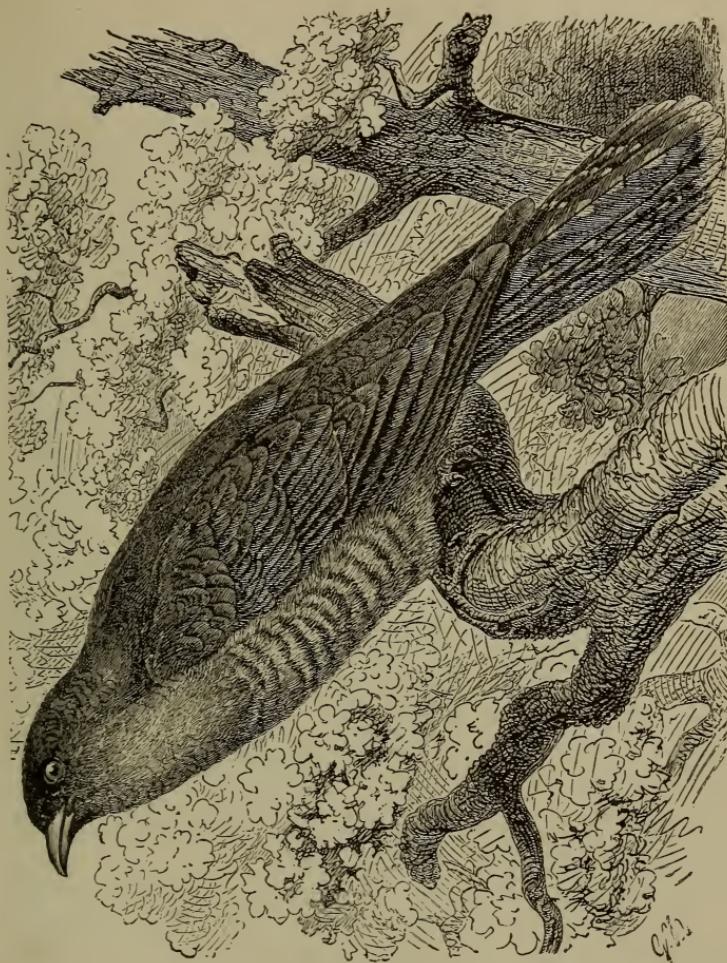
Woodpeckers is the method by which they are enabled to thrust the tongue deep into the crevices and bring out any insects that may happen to be there. The tongue is connected with two elastic ligaments, which are inserted near the juncture of the upper mandible with the skull. From thence they sweep round the back of the head, and passing under the lower mandible, enable the tongue to be thrust out a considerable distance. The tip of the tongue is sharp, and barbed with several filaments, and more firmly to secure the prey, a kind of gummy secretion causes those insects to adhere that would be too small to be impaled.

It appears to be an erroneous opinion that these birds injure trees. Their only object in pecking away the wood and bark is to get at the insects, which they know are hidden within. Now, insects seldom or never bore into healthy wood, but a decayed branch or stump is always full of them; so the winged entomologist, when he perceives a decayed branch, or finds an unsound spot in the trunk, immediately sets to work industriously, and is rewarded by finding plenty of insects, which he draws out and demolishes.

Although the Woodpecker does not scoop away sound trees, yet it is because it has no motive for doing so—not that the power is wanting. Wilson had an Ivory-billed Woodpecker in his possession, which pecked away lath and plaster in its efforts to escape, and utterly ruined a mahogany table to which it was fastened.

The GREEN WOODPECKER is by far the most common, and may be often seen in woods, tapping the trees with wonderful rapidity. It generally runs up the trunk of the tree in a spiral direction, occasionally striking off large pieces of dry bark. When it descends, it still keeps its head uppermost.

I have often seen the Green Woodpecker busily employed among the trees. I have never seen it on the ground, and once only on the smaller branches of the trees.



COMMON CUCKOO.

The WRYNECK is tolerably common in the southern counties of England, but is scarcely ever seen in the north and west. It principally feeds on ants, which it picks up with great rapidity by means of its long tongue, covered with a glutinous secretion like that of the Woodpecker. The rapidity with which the ants are taken is so great that "an ant's egg, which is of a light color and more conspicuous than the tongue, has somewhat the appearance of moving to the mouth by attraction, as a needle does to the magnet." The term Wryneck is given it from its habit of rapidly twisting its head and neck, and hissing like a serpent, if disturbed upon its eggs. The young also hiss if they are molested. Its eggs are laid on the bare wood in the holes of trees. Like most eggs that are laid in holes; they are of a pure white. The length of the bird is 7 inches.

The CUCKOO, spring's harbinger, has, in all ages, obtained for itself a name at once pleasing and disreputable; pleasing, because its well-known notes are a sign that the cold winter is gone, and disreputable, because it usurps the nests of other birds, of which the Hedge Sparrow is the usual victim. In its nest the Cuckoo deposits one of its own eggs, which are remarkably small in proportion to the size of the bird. The unsuspecting Hedge Sparrow hatches the intruder together with her own young. The Cuckoo rapidly increases in size, and monopolizes no small portion of the entire nest, besides taking the lion's share of the provisions. The mother, however, never seems to see the difference, but feeds and tends the interloper with quite as much care as her own young.

The young Cuckoo ejects the rightful occupants of the nest, by managing to get the egg or young bird upon its back, clambering up to the edge of the nest, and then throwing it over by a sharp jerk.

At some times of the year, Cuckoos are comparatively tame. I have repeatedly decoyed them by imitating their

cry, until they came near enough for me to see the movements of the beak.

The Cuckoo feeds principally upon the hairy caterpillars, especially those of the tiger-moth, the hairs of which form a kind of lining to its stomach. These hairs are placed so regularly that it was imagined for some time that they were a growth from the stomach itself. To settle the point, the microscope was brought to bear on the subject, and by its aid, the hairs were found to be exclusively those of the caterpillar.

The Cuckoo will also feed on other insects. Gilbert White saw several Cuckoos engaged in feeding by a large pond. They were employed in catching the dragon-flies, some of which they took while resting on the water plants, and others they caught on the wing.

The DOVE family is supposed to be more widely distributed than any other. The RINGDOVE is the largest of the Pigeons. A black ringlet round the neck, edged with white, gives it the name of Ringdove. It is very common, and its nests are usually found to consist of a few sticks, thrown loosely together on a spray of fir or holly. The structure of this platform, for nest it can hardly be called, is so loose, that the white eggs can generally be seen from below through the interstices of the nest.

The following group comprises the most conspicuous varieties of the Domestic Pigeon. All these birds, except the Carrier, the Pouter and Tumbler, are very similar in their habits and need no description.

The TUMBLER is a very little pigeon, and derives its name from its singular habit of falling backwards when on the wing. Pigeon fanciers assert that a flight of twelve Tumblers may be covered with a handkerchief.

The POUTER is a large pigeon. It stands particularly erect, and seems exceedingly vain of the swollen crop which gives it the name of Pouter. The bird is enabled to inflate its crop with air, until the head is almost hidden

behind it. This inflation sometimes causes the bird to lose its balance and fall down chimneys, on which it is fond of standing.

The CARRIER PIGEON is the bird that was employed to take messages before the invention of the telegraph rendered even the speed of the wind too slow for the present day. The most valuable Carriers were trained to carry to and from their residence. A letter was written on a small piece of paper, and fastened under the wing of the Pigeon, or to its feet. The feet were then bathed in vinegar to keep them cool, lest the bird should stop on the way to bathe. When the Pigeon was set free, it rose high in the air, made one or two circular flights, and then darted off like an arrow in the proper direction. One of these birds has been known to fly nearly 150 miles in one hour.

The PEACOCK. This magnificent bird has been domesticated in several countries. Some suppose that it was first brought from India by Alexander, and by him introduced into Europe. The gorgeous plumes that adorn the Peacock do not compose the tail, as many suppose, but are only the tail coverts. The tail feathers themselves are short and rigid, and serve to keep the train spread, as may be seen when the bird walks about in all the majesty of his plumage.

Although Pea-fowl seek their food on the ground, they invariably roost on some elevated situation, such as a high branch, or the roof of a barn or haystack. When the bird is perched on the roof, its train lies along the thatch, and is quite invisible in the dark.

In the times of chivalry, a roasted Peacock, clothed in its plumage, and with its train displayed, formed one of the chief ornaments of the regal board. The nest of this bird is made of sticks and leaves rudely thrown together, and contains from twelve to fifteen eggs. The young do not attain their full plumage until the third year, and only the males possess the vivid tints and lengthened train, the



PEACOCK.

female being a comparatively ordinary bird. A white variety of the Peacock is not uncommon. In this case, the eyes of the train feathers are slightly marked with a kind of neutral tint. The voice of the Peacock is as unpleasant and unmusical as its external appearance is attractive.

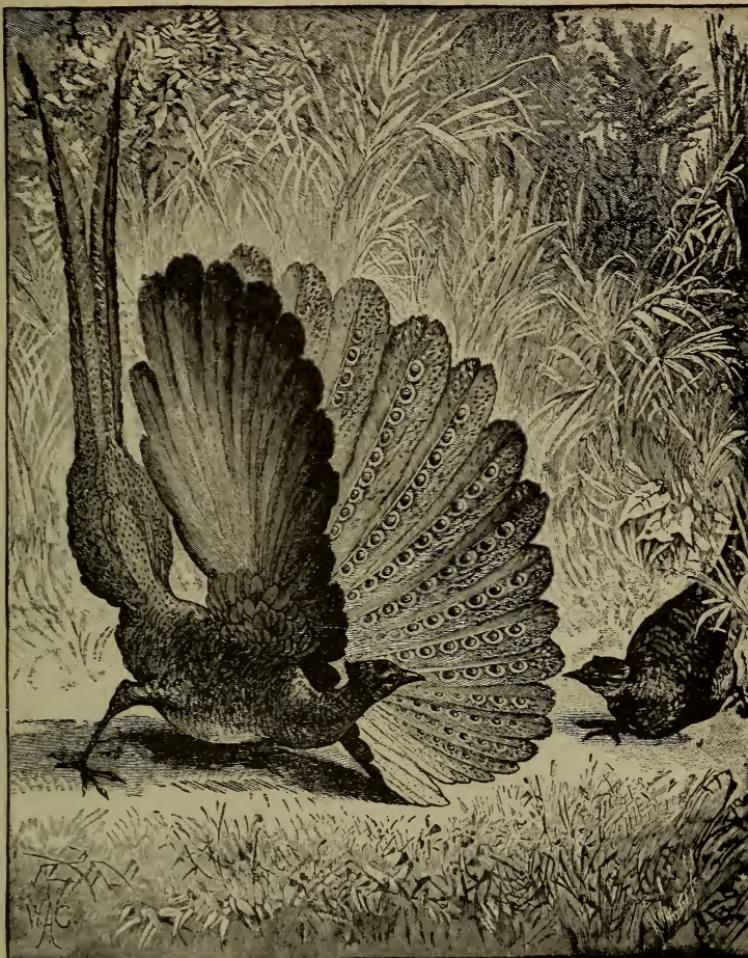
The COMMON PHEASANT was originally brought from Georgia. It is a hardy bird, and bears the cold months very well. Although it can be tamed, and will come to be fed with the poultry, yet an innate timidity prevents it from being thoroughly domesticated. Young Pheasants that have been hatched under a hen, scamper off in terror if an unexpected intruder makes his appearance among them, although the remainder of the poultry remain perfectly unconcerned.

This bird loves to perch at night on trees, especially on the spreading branches of the larch.

A white variety of the Pheasant sometimes occurs, but seems never to be propagated. The nest of the bird is made on the ground, and contains about fifteen eggs.

The DOMESTIC FOWLS are too well known to need much description. There are many varieties, the most conspicuous of which are the Cochin-China, Crested and Bantam. The Game Fowl was formerly in great request for the cruel sport of cock-fighting. The Java Fowl, of which the enormous Cochin-China bird is a variety, is supposed to be the origin of the barn-door fowl. The cock has been long celebrated for his warlike propensities, and his habit of greeting the approach of morn by his "shrill clarion."

The Bantam is a very little bird, indeed, but exceedingly courageous, and does not hesitate to attack a Turkey or such large bird with most amusing pompousness of manner. Some Bantams have their legs thickly feathered down to the very toes. The hackles, or long neck-feathers of this and the preceding bird, are much used by anglers for making artificial flies.



ARGUS PHEASANT DISPLAYING.

The celebrated Jungle Fowl of India belongs to this race, and is by many supposed to be the origin of our domestic game fowl. The Chinese, who are greatly addicted to the sport of cock-fighting, prefer this bird for their cruel amusement.

The Dorking Fowl is a large and delicate species. The chief peculiarity in this bird is the double hind toe, so that it has five toes instead of four.

The TURKEY is an inhabitant of America, and appears to have been imported into Europe about the year 1600. Its habits, when wild in its native woods, are rather interesting. It is partly migratory in its habits, moving from the parts about Ohio, Kentucky and Indiana towards the Ohio and Mississippi. The march is usually performed on foot in large flocks, the birds seldom using their wings except when attacked, or in order to cross a river. The powerful birds can easily cross a river of a mile in breadth, but the weaker frequently fall into the water, and then paddle to shore with some rapidity. This migration is performed about the end of October.

The PARTRIDGE is known as one of the birds included in the designation of "game." It lays about twenty eggs in a rude nest placed on the ground, and displays great attachment to them, and no small ingenuity in decoying an intruder away. It is said that a gentleman who was overlooking his plowman saw a Partridge run from her nest, almost crushed by the horses' hoofs. Being certain that the next furrow must bury the eggs and nest, he watched for the return of the plow, when to his great astonishment the nest, previously containing twenty-five eggs, was vacant. After a search, he found the bird sitting upon the eggs under a hedge, nearly forty yards from the nest, to which place she and her mate had removed the whole number in less than twenty minutes. In some parts of the country the Partridge is very plentiful—one sportsman having shot in two days 168 brace.

The length of the bird is about twelve inches ; the wing is short and rounded, causing the peculiar whirring sound when in motion.

The QUAIL (Bob White) is a quite common little bird. Countless flocks of them are spread over the Southern and Middle States, and many are taken and sent to the New York markets.

Temmick states that hundreds of thousands arrive in Naples and Providence, and are so fatigued that for several days they suffer themselves to be taken by hand. We are here reminded of the flight of Quails with which the Israelites were fed, the sacred narrative even preserving the nocturnal flight of these birds. "And it came to pass, that *at even* the Quails came up and covered the camp." Probably the instinct to fly by night is implanted in them for the purpose of avoiding the birds of prey that would attack them by day. The female lays from seven to twelve eggs in a rude nest on the ground.

The length of the bird is seven inches.

The BLACK GROUSE is still found on the moors of Scotland and some parts of England, and, together with the red grouse, tempts sportsmen to spend their leisure months on the moors.

The legs and feet of the PTARMIGANS are thickly covered with hair-like feathers, reaching as far as the claws. Their plumage bears a singular analogy to the fur of the ermine and some other quadrupeds, as it changes in winter from a rich tortoise-shell color to a pure white. It inhabits the northern parts of Europe and America, and is also found in the north of Scotland, principally among the mountains. The color of the bird is so similar to that of the mossy and lichen-covered rocks among which it dwells that a whole covey easily eludes an unpracticed eye.

Great numbers of them are annually imported from the north of Europe, especially from Norway and Sweden, to the London market. One poultorer has purchased 15,000

of these birds, and 24,000 have been exported in one ship from one place.

Like that of the Grouse, the Ptarmigan's nest is a loosely-constructed heap of twigs and grass, and contains usually twelve eggs.

The MOUND-MAKING MEGAPODE inhabits the dense thickets bordering on the sea-shore, and is never found far inland. Like the Brush Turkey, it deposits many eggs in one mound, but instead of placing them at intervals in the mound, the bird makes deep holes, from five to six feet, at the bottom of which the eggs are deposited. The natives obtain the eggs by scratching up the earth with their fingers until they have traced the hole to the bottom; a very laborious task, as the holes seldom run straight, and often turn off at right-angles to avoid stone or root. The mounds are enormously large. Mr. Gilbert was told by the residents that they were the tombs of the aborigines, nor was it until after some time that their real nature was made known. The height of one mound was fifteen feet, and its greatest circumference at the base sixty feet.

The OSTRICH is the largest bird as yet known to exist, its height being from six to eight feet. It is an inhabitant of Africa, and from thence the elegant plumes are brought. These plumes are mostly obtained from the wings of the bird, and not from the tail, as is generally imagined.

An immense number of eggs are laid by the Ostriches in one spot, several birds belonging to each nest. The eggs are very large and strong, and are in general use by the Bosjesmans for holding water. By means of these eggs, which they bury at intervals in the sand, after filling them with water, they are enabled to make inroads across the desert and retreat with security, as none can follow them for want of water. Each egg holds rather more than five pints. An excellent omelet is made by the natives by burying the fresh egg in hot ashes, and stirring round the



OSTRICH.

contents with a stick through a hole in the upper end until thoroughly cooked.

The principal strength of the Ostrich tribe lies in the legs. These limbs are so powerful that a swift horse has great difficulty in overtaking the bird. As the Ostrich mostly runs in large curves, the hunters cut across and intercept the bird, which would in all probability escape if followed in its exact course.

The Ostrich is easily tamed. They frequently astonish the visitor at the zoological gardens by suddenly snatching out of his hand a bun or a cake, their long necks enabling them to reach a surprising distance. Many have doubtless seen the tame Ostriches at the Hippodrome, who ran races bearing riders on their backs, and seeming to enjoy the sport as much as any of the spectators.

The food of the Ostrich is vegetable, and it swallows many stones, etc., to assist it in grinding its food. When in confinement it picks up anything—glass, nails, etc.—from the effects of which it sometimes dies. I have assisted at the dissection of an Ostrich, and have seen an astonishing amount of pebbles and other hard materials taken from its stomach, among which were a tolerably large piece of deal, and a portion of a brickbat.

The RHEA, or American Ostrich, is abundant on the banks of the river La Plata, and is chased by the Gauchos, who pursue it on horseback, and kill it by throwing the celebrated "bolos." These curious weapons are made of a long leathern thong, having a heavy stone or leaden ball attached to each end. The Gaucho can throw it so as either to stun his prey with a blow from the ball, or strangle it by causing the thong to twist round its neck.

It is known that the Rhea can swim well, and it has been seen to cross rivers several hundred feet in width, a power which the Ostrich and the Cassowary are not ascertained to possess. There are two species of this bird—one, the Darwin's Rhea, has been but lately introduced to science.

The CASSOWARY is a native of the eastern parts of Asia. Like the Ostrich, it cannot fly, but runs with great swiftness, and if attacked by dogs kicks with extreme force and rapidity. The feathers of this bird are remarkable for being composed of two long, thread-like feathers sprouting from the same root. The wing feathers are round, black and strong, and resemble the quills of the Porcupine. At the end of the last joint of the wing is a sort of claw or spur. The crest upon its head is composed of a cellular bony substance.

The food of the bird consists of vegetable substances, and it will frequently swallow a tolerably large apple entire, trusting to the pebbles, etc., in its stomach to bruise it.

The EMEU is a native of New Holland, and nearly equals the Ostrich in bulk, its height being between five and six feet. Its feathers lie loosely on the body, and its wings are small and hardly to be distinguished. The skin of the Emeu furnishes a bright and clear oil, on which account it is eagerly sought after.

In its manners the Emeu bears a close resemblance to the Ostrich. Its food appears to be wholly vegetable, consisting chiefly of fruits, roots and herbage, and it is consequently, notwithstanding its great strength, perfectly inoffensive. The length of its legs and the muscularity of its thighs enable it to run with great swiftness; and as it is exceedingly shy, it is not easily overtaken or brought within gun-shot. Dogs will seldom attack it, both on account of some peculiar odor in its flesh which they dislike, and because the injuries inflicted upon them by striking out with its feet are frequently very severe.

Its flesh has been compared to coarse beef, which it resembles both in appearance and taste. The hind-quarters are the only part fit for culinary use.

The voice of the Emeu is a kind of low booming sound. The eggs are six or seven in number, of a dark green color, and are much esteemed by the natives as food. When the

natives take an Emeu they break its wings, a curious custom of no perceptible utility.

The APTERYX. This extraordinary bird, whose name is derived from the apparent absence of wings, those members being merely rudimentary, inhabits the islands of New Zealand. It conceals itself among the densest fern, and when hunted by dogs it hastens to seek a refuge among rocks and in the chambers which it excavates in the earth. In these chambers its nest is made and the eggs laid. The natives hunt it with great eagerness, as the skins are used for the dresses of chiefs, who are so tenacious of them that they can hardly be persuaded to part with a single skin. The feathers are employed to make artificial flies. When attacked it defends itself by rapid and vigorous strokes with its powerful feet.

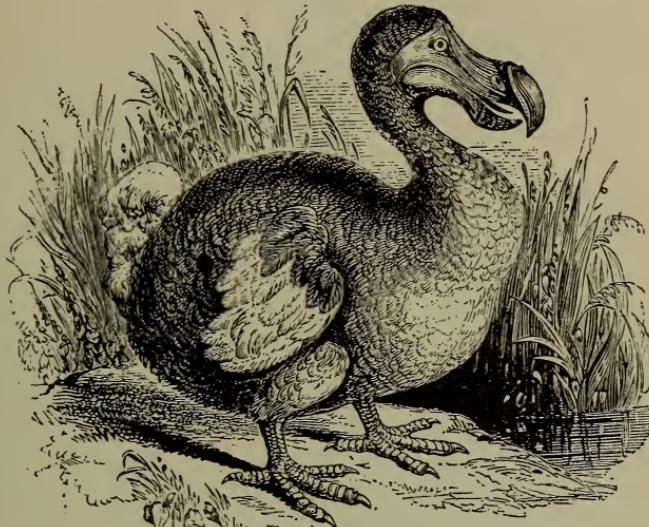
For many years naturalists considered it an extinct species. The question has been set at rest by the arrival in London of several skins and one living specimen, now in the Zoological Gardens. This bird has a singular habit of resting with the top of its bill placed on the ground. The nostrils of the Apteryx are placed almost at the very extremity of the bill. The aborigines of New Zealand give it the name of Kiwi Kiwi. The food of the bird consists of snails, insects and worms, which latter creatures it obtains by striking the ground with its feet, and seizing them on their appearance at the surface.

The DODO. This singular bird, which is supposed to be extinct, was discovered in the Mauritius by the earlier voyagers. For many years their accounts of the Dodars were supposed to be mere flights of fancy. Lately, however, the discovery of several relics of this bird in various countries has set the question of its existence at rest, but not the question of the proper position of the bird. Some think it belongs to the Pigeons and some to the Ostriches.

It is still within the range of possibility that this bird may again be discovered, as at present but little of Mada-

gascar has been searched, and in that island, if anywhere, it will be found.

The GREAT BUSTARD is now scarcely ever seen in England, although formerly it was tolerably common. It runs with great swiftness, and will never rise on the wing until forced, so that instances have been known of Bus-



THE DODO.

tards being captured by greyhounds. It is exceedingly wary, and can hardly be approached within gun-shot, except by adopting some disguise, as a laborer with the gun in his wheelbarrow, or by driving a cart or a carriage by the spot where it is feeding.

The male Bustard possesses a membranous pouch on the fore part of the neck capable of holding six pints of water. There is an opening to this pouch under the tongue, and its use is possibly, like that of the pelican, to

carry water for the use of the young ; but this is not ascertained. Its length is more than three feet. Its nest is a loose heap of straw on the ground, and contains two pale-brown eggs, rather larger than those of the turkey.

The PLOVERS are known by their long legs, short toes and long, powerful wings. Many are inhabitants of America, of which the Upland or Field and Golden Plover are the most common.

The Golden Plover is very common in most parts of the United States, and is well known from its plaintive cry and the stratagems it employs to decoy intruders away from its nest, or rather eggs, for nest it has none. Frequently, however, the attempts of the bird only draw the attention of the passer-by to the evident vicinity of the eggs. These eggs are dark brown, blotched with black, and are hardly to be distinguished from the soil where they are laid. If an intruder approach them the bird glides before him, and flutters along, drooping her wings, as if wounded, invariably endeavoring to lead him away from her nest. When it has succeeded in decoying away the intruder it suddenly mounts in the air, uttering its cry of pee-weet, leaving the pursuer to gaze with astonishment at the escaping bird. The eggs are sold under the title of "plovers' eggs," and are considered great delicacies. When flying, the black and white plumage makes it very conspicuous. On the head of the bird is a kind of a crest.

The COMMON CRANE is now but rarely seen, although it formerly was common. It flies at so great a height that although its hoarse cry is audible, the bird itself is far out of reach of sight. It generally feeds on snails, frogs and worms, but is not by any means averse to newly-sown grain. The nest is made among reeds and rushes, and contains two eggs. It is nearly four feet in length.

The HERON is a bird renowned in the noble science of falconry.

It generally breeds in company, like the Rooks ; indeed,

these two birds frequently inhabit contiguous trees, but never interfere with each other. In the dawn of the



HERON (in Breeding Plumage).

early morning, or while the moon casts an uncertain light, the Heron may be seen standing in the shallow water,

stiff and motionless, and by the faint light may be mistaken for a stump of a tree. But his eye is keenly directed on the water, and no sooner does a fish approach than a dart of his unerring bill secures it, and the Heron soars exultingly to his nest, bearing his prey with him. The fixed patience that the Heron displays has caused it to be chosen as the emblem of solitude.

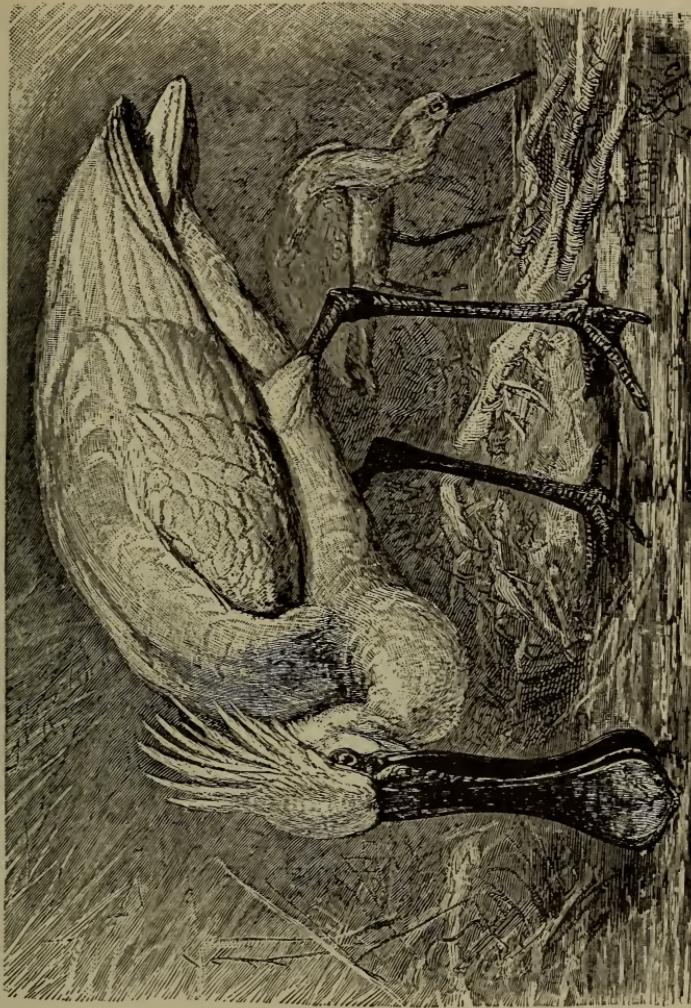
The plumes of the Heron were formerly considered as ornaments, only to be worn by the noble.

It has been lately ascertained that the Heron can swim in deep water, and does so when it sees any prey that cannot be reached by wading, such as a nice nestful of young moor-hens, or a water-rat engaged at his dinner.

The nest of the Heron is a flat mass of sticks, laid on the highest branches of a tree, and contains five eggs. The length of the bird is about three feet. An old name of this bird was the Herne, or Hernshaw, from which was derived the saying, "He does not know a Hawk from a Hernshaw." The last word has been corrupted into "handshaw," which renders the proverb unmeaning.

The beautiful BITTERN has been almost banished from England, although it was formerly a common bird. It frequents morasses and dense beds of reeds, where it lies concealed until evening, when it leaves its rushy bed and soars to a vast height, continually uttering its sepulchral booming cry. This singular sound is not unlike the bellowing of a bull, and is most startling in its effect.

In olden times the Bittern was one of the birds chiefly sought after in falconry, as the stout defence it makes against its enemies, by darting its sharp and powerful beak at them, and beating violently with its feet, renders it by no means an easy prey. For this reason, the falconer's first care on reaching the Bittern, when brought to the ground by his falcon, was to secure its head, and by fixing its bill deep in the earth, to save his eyes from the rapid and well-aimed blows of the wounded bird. The



WHITE SPOONBILL.

Falcon also was in danger of being transfixed by the sharp beak of his victim.

The plumage of this beautiful bird is a rich reddish-yellow-ground, boldly variegated with various black marks, which are most conspicuous in the loose, long feathers that decorate its neck. In size it is a little less than the Heron. It feeds principally on small reptiles, field-mice and fish. Its nest is built on some slight elevation in a morass, and contains five eggs.

The WHITE SPOONBILL is found in Europe, Asia and Africa and frequents Holland, together with the Stork. The strange shape of the tip of its beak has gained it the name of Spoonbill. It feeds on worms, snails and water-plants, searching for the latter by agitating the water with its broad beak.

The nest of the Spoonbill is sometimes placed in trees and sometimes amid rushes. It contains three whitish eggs, slightly spotted with red. The length of the bird is not quite three feet.

The STORK is extensively found in Europe, Asia and Africa. In Holland Storks are very abundant, and are encouraged by the Dutch to build in their towns. Among the ruins of Persepolis they are very common, scarcely one pillar being without a Stork's nest at the summit. In Holland a kind of false chimney is built by the inhabitants for these birds to make their nests in. When the Stork cannot find a building on which to make its nest, it chooses the flat, spreading branches of a cedar or pine, and there collects a large mass of sticks and twigs, on which it lays from three to five whitish eggs. When disturbed, the birds make a great clattering with their bills.

Its food consists of rats, mice, frogs, etc., and it is for the benefits it confers upon man by devouring these vermin that it is so carefully protected and encouraged, especially in the east, where the inhabitants do not trouble themselves by removing carrion or offal, but leave that office

to the Vultures, Hyenas and other scavengers of nature. Its height is nearly four feet.

The SACRED IBIS inhabits Egypt, but does not seem to breed there. This is the bird so frequently depicted in the hieroglyphics as playing a conspicuous part in religious ceremonies. Their mummies are constantly found in the tombs, and in one of these mummies Cuvier discovered remnants of skin and scales of snakes. It is a migratory bird, appearing simultaneously with the rise of the Nile, and departing as the inundation subsides. The Sacred Ibis is about the size of an ordinary fowl.

The CURLEW is often found in the northern parts of England and Scotland, and is spread over the whole of the Old World, from South Africa to the polar regions. In winter it collects in large flocks on the muddy shores of the sea, where its long, curved bill can easily penetrate in search of food. It is an exceedingly shy bird, and cannot easily be approached within gun-shot.

Its nest is composed of grass and rushes, collected under the shelter of a tuft of heath or grass, and contains four eggs. Its length slightly exceeds two feet.

The common AVOCET is spread throughout the warmer regions of Europe, and is also found in some parts of Africa. It is very common in Holland, and is frequently seen on the eastern coast of England, but seldom visits Scotland. It frequents marshes and the mouths of rivers, where it finds in the mud myriads of the small worms and insects on which it feeds, and which it obtains by scooping them up from the mud with its curiously-curved bill. It is a remarkably good swimmer, but it seldom has recourse to that art except when it wades unexpectedly out of its depth.

The eggs of the Avocet are laid on the ground, in a depression sheltered by a tuft of herbage. Their color is a bluish green, spotted with black. The birds when disturbed at their nests feign lameness, like the Lapwing, in

order to draw the intruder to a distance. The length of the bird is eighteen inches.

The Woodcock frequents dense thickets during the day, but at night it leaves these retreats and visits the swamps and flooded meadows, where it finds a sufficiency of worms and insects.

Its nest is a loose mass of grass and leaves, gathered together in some sheltered depression. The eggs are four in number.

The SNIPE is too well known to need description. In its habits it much resembles the Woodcock. Its flight is very singular, rendering it a difficult mark.

The CORNCRAKE, or LANDRAIL, is very common in England. It reaches there early in April, and leaves at the end of October, after hatching its eggs. During the early part of the summer months its harsh cry may be heard in almost every field, but the bird itself is very seldom seen, as it threads its way among the long grass with marvellous rapidity. Its cry can be so exactly imitated by drawing a quill sharply across the teeth of a comb that the bird may be decoyed by the sound until quite close to the operator. The Corncrake is so averse to rising on the wing that a dog is frequently employed to hunt it. The young when taken feign death with admirable accuracy, nor do they move until they imagine that the intruder is out of the way.

The nest of the Corncrake is by no means uncommon. It is formed of hay, collected and worked into some depression in the ground, and contains from eight to twelve eggs. Its length is about nine inches.

The WATER-HEN, or MOOR-HEN, is very common along the reedy banks of rivers and ponds. It is very widely distributed, being found in almost all parts of the Old World. It swims very gracefully, constantly nodding its head, and dives with great skill and rapidity, particularly when alarmed, in which case it generally dives under some floating herbage, and remains there with merely its beak above

the water until the danger is passed. On account of this



FLAMINGO.

habit, it is almost useless to shoot this bird unless the sportsman is accompanied by a dog, for if it is not shot

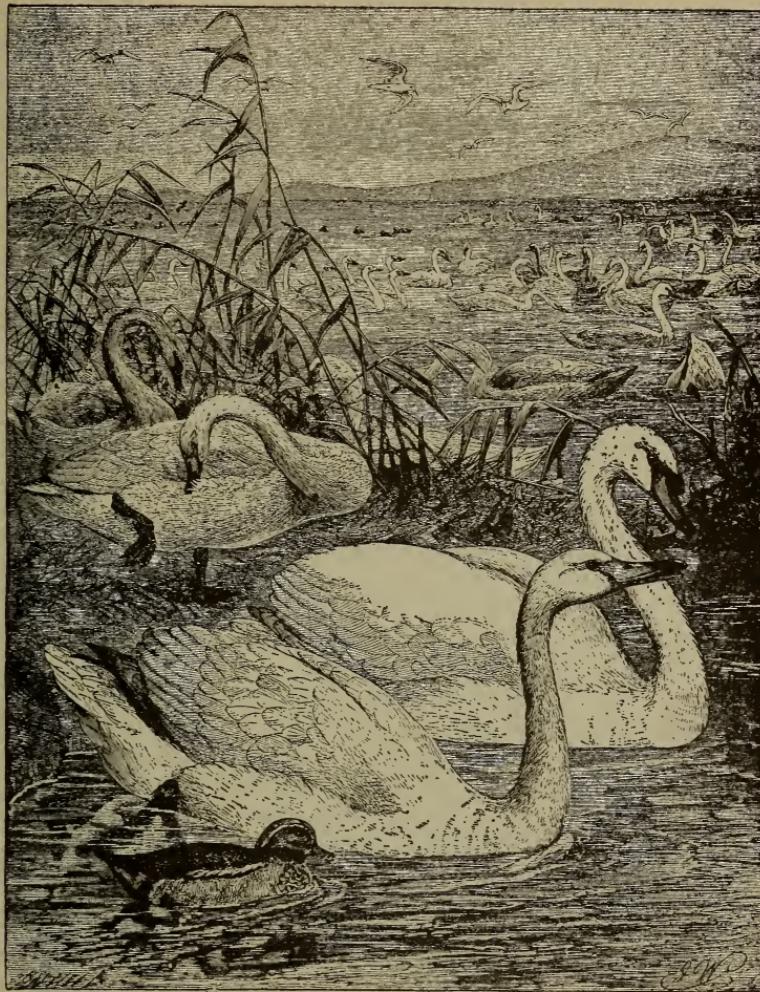
dead it instantly dives, and nothing but a dog can discover its retreat. It runs on land with considerable activity, constantly flirting up its tail, so as to show the white feathers beneath, and, when alarmed, instantly makes for the water.

The water-hen's nest is built among sedges and reeds, at the water-side, and contains from five to eight eggs. When the water-hen leaves her nest, she covers the eggs with dried grass and reeds, so as completely to conceal them, apparently lest the rats should discover them. The young when hatched look like round tufts of black down. They swim and dive well, following their parent with great address. The pike is their chief enemy, and destroys numbers by darting at them from under the cover of water-lilies or other plants.

The FLAMINGO is an inhabitant of the warmer parts of Europe, and is common in Asia and on the coasts of Africa. The singularly-shaped beak of this splendid bird is peculiarly adapted to its long and flexible neck. When the bird wishes to feed, it merely stoops its head into the water; the upper mandible is then lowest, and is well fitted to receive the nutritive substances which are entangled in a filter placed on the edges of the beak, much resembling the analogous apparatus of the whale.

The Flamingo frequents marshes, lakes, and mouths of rivers, bidding defiance to the pestilent exhalations that drive man far from their haunts. The color of their plumage is a deep, brilliant scarlet, except the quill feathers, which are black. When a number of these birds stand ranged in a line, according to their custom, they present the appearance of a small and well-drilled body of soldiers, but are far more dangerous to approach than the most formidable army, for the miasma of the marshes has a more deadly aim than the rifle, and its breath is more certainly fatal than the bullet.

The nest of the Flamingo is a curious conical structure



BEVICK'S SWAN. WHISTLING SWAN. MUTE SWAN.

of mud, with a cavity at the summit, in which are placed two or three whitish eggs. When the female bird sits on the nest, her feet rest on the ground, or hang into the water. Its height is about six feet.

The MUTE or TAME SWAN, a well-known ornament in lakes and rivers, was introduced from Eastern Europe and Asia several hundred years ago. All are familiar with the graceful deportment of this bird while sailing on the water. Its progress on land is confined to an awkward waddle.

The female Swan makes its nest of a great mass of dry reeds, placed among osiers or rushes near the water, and lays six or eight large white eggs. During the time of incubation, and while the young are still small, the parent birds defend them with great assiduity and courage.

A BLACK SWAN has been discovered in Australia, the whole of whose plumage is a jetty black, with the exception of the quill feathers, which are white. It has been domesticated, and may be seen in many of the great parks.

The MALLARD or WILD DUCK is the origin of our domestic bird, and is widely spread over the northern parts of Europe, Asia, and America. In the winter it migrates in countless flocks to the warmer States. Incredible numbers of these birds are taken in a very ingenious trap, called a decoy. It is a perfect edifice of poles and nets, and is built in the form of a tube, very wide at the mouth, and very narrow at the extremity. The ducks are induced to enter the "pipe" by the antics of a dog; and by some hemp-seed previously strewn on the water. They are then driven onwards to the smaller end, where they are caught and killed.

The COLYMBIDÆ are remarkable for their powers of diving. The legs are placed very far behind, and the toes are so arranged as to fold up when returning from the stroke.

The foot of the GREBES is not webbed like that of most water-birds, but each toe is separated and flattened so as

to serve as a separate paddle. The Grebes dive so instantaneously that it is difficult to shoot them, as they dive at the flash, and do not reappear for nearly two hundred yards, and then they merely raise their head above water for a second, and again disappear.

All the Grebes feed upon fishes and the various water-insects, but their stomachs are almost invariably found to contain a mass of their own feathers. This circumstance presents a singular analogy to those masses of compacted hair which are found in the stomachs of cows. In all probability the reason for their presence is the same, that the feathers and hairs are accidentally conveyed to the stomach after the creature has been making its toilet.

Of the three species of Divers, the GREAT NORTHERN DIVER is the largest. It is generally found on the shores of the Orkneys and Shetland.

This bird justly deserves its name of Diver, as it can pursue fish under water with the greatest ease and certainty, and can remain under water for a long time.

The nest of this bird is a tolerably large flattened mass of dead herbage, and is placed near the water's edge, in some place where the bird imagines that the reeds and flags, among which it is laid, will guard it from discovery. But, unfortunately, the bird dislikes flying, and prefers to walk to and from its nest, thereby leaving a very evident track, by which it is often discovered.

The eggs are usually two in number, although three have been found in one nest.

The PUFFIN is common at the Needles and on the western islands of England. It forms deep burrows in the soil, in which one egg is deposited, or usurps the burrow of a rabbit. The hole is generally from three to four feet in depth, when the Puffin is forced to labor for itself; it usually takes a winding course; and the inhabitant is secured from surprise by forming two entrances, in order that if one entrance is attacked it may escape by the other.

The egg is always deposited at the furthest extremity of the hole, and is not easy to be obtained, on account of the vigorous resistance made by the parent bird. It is an excellent diver, plunging fearlessly from a lofty cliff into the sea, and speedily returning with its beak full of fish, usually sprats, which are secured by their heads, and lie in a row along the bill of the Puffin, forming a kind of fish fringe. Its enormous and sharp-edged bill renders it a formidable antagonist to intruders. The length of the bird is thirteen inches.

It is said that the Raven and the Puffin have occasional conflicts, the object of dispute being generally the egg or young of the Auk, for which the Raven has a great predilection. The issue of the combat depends principally on its position, each bird trying to keep to its own peculiar element. If the Puffin can drag the Raven over the rocks into the sea, it is speedily victorious, as it drowns its sable adversary without much trouble; but if, on the contrary, the Raven can keep to shore, its superior size and strength gain the dominion.

The CAPE PENGUIN is very common at the Cape of Good Hope and the Falkland Islands. From the extraordinary sound it produces while on shore, it is called the Jackass Penguin. Darwin gives the following interesting account of this bird: "In diving, its little plumeless wings are used as fins, but on the land *as front legs*. When crawling (it may be said on four legs) through the tussocks, or on the side of a grassy cliff, it moved so very quickly that it might readily have been mistaken for a quadruped. When at sea and fishing, it comes to the surface for the purpose of breathing with such a spring, and dives again so instantaneously, that I defy any one at first sight to be sure that it is not a fish leaping for sport."

These birds feed their young in a singular manner. The parent bird gets on a hillock, and apparently delivers a speech for a few minutes, at the end of which it lowers

its head and opens its beak. The young one thrusts its head into the beak of the mother, and seems to suck its substance from the throat of the parent bird. Another



PENGUIN.

speech is made, and the same process repeated until the young is satisfied.

This Penguin is very courageous, but utterly destitute of the better part of courage—discretion; for it will boldly charge at a man. A few blows from a stick is sufficient to lay a dozen birds prostrate.

The STORMY PETREL is, under the name of Mother Carey's Chicken, the terror of the sailor, who always considers the bird as the precursor of a storm. It is the smallest of the web-footed birds. Few storms are violent enough to keep this curious little bird from wandering over the waves in search of the food that the disturbed water casts to the surface. Like the Fulmar, the Stormy Petrel is so exceedingly oily in texture that the inhabitants of the Feroe Islands draw a wick through its body and use it as a lamp.

The WANDERING ALBATROSS, the largest of the genus, is a well-known bird in the southern seas, following ships for many miles in hopes of obtaining the refuse thrown overboard. So voracious is the Albatross that it will swallow a five-pound fish entire. Its flight is peculiarly majestic. Its extreme length of wing prevents it from rising at once from the ground, but when once launched into the air, it seems to float and direct its course without effort. The expanse of wing in the Wandering Albatross is nearly fourteen feet.

The voracity of the Albatross renders it an easy prey. A hook is baited with a piece of blubber, fastened firmly to a string, and suffered to tow astern. The bird sweeps down to seize its prey, and is arrested by the hook, by means of which it is drawn into the ship. It seems rather remarkable that a bird that lives in or over the sea during its whole life should prove a landsman when taken on board. Yet, when caught and placed on deck, it begins to stagger about, and soon becomes as thoroughly sea-sick as the most inexperienced sailor.

The BLACK-BACKED GULL is a common bird on the coasts. During the winter it seeks the warmer coasts of southern Europe. It breeds in great numbers on the shores of the Bristol Channel, the Orkneys, and other coasts of Great Britain. Its nest is composed of grass, rushes, and other materials, and contains three or four

eggs. Neither the gulls nor the terns dive, but snatch up their prey when at or near the surface.

The TERNS, or SEA-SWALLOWS, are possessed of great



EUROPEAN PELICAN.

power and endurance of flight, their long forked tails and pointed wings indicating strength and swiftness.

They are found in plenty along the southern shores of Europe, in many parts of Asia and Africa, and are frequently seen on the southern shores of England, and have been found in North America. It preys on fish, which it snatches from the surface with unerring aim, as it skims over the waves with astonishing velocity.

Its nest is made on the sand above high-water mark, and contains two or three eggs, on which the female usually sits by night. Its length is about fourteen inches.

The Noddy, so frequently celebrated by travellers who have passed the equator, is a species of Tern.

The CORMORANT is found in abundance, being widely spread over many parts of the world. It is exceedingly voracious, and devours a great amount of fish. It is an excellent diver, and chases the fish actually under the water, seldom if ever returning without having secured its prey. Like the Otter, when engaged in chase, it occasionally rises to take breath, and then resumes the pursuit with renewed vigor.

The Cormorant has the power of perching on trees, an accomplishment one should hardly suspect a web-footed bird of possessing.

It is easily tamed, and its fishing propensities can be turned to good account. The Chinese employ a kind of Cormorant for that purpose, having previously placed a ring round the bird's neck, to prevent it from swallowing the fish. The eggs of this bird are usually laid on the rock, but sometimes in the branches of trees. A thick coat of chalk envelopes the eggs, and can be easily scraped off with a knife. Its length is about three feet.

The WHITE PELICAN inhabits Africa, India and great part of the southeastern portions of Europe. It is a very conspicuous bird, its singular membranous pouch offering a distinction perfectly unmistakable. The pouch, when distended, holds two gallons of water, but the bird has the power of contracting it so that it is scarcely to be discerned.

The pouch also serves as a net in which to scoop up the fish on which the Pelican feeds. Another most important use of the pouch is to convey food to the young. The parent Pelican presses the pouch against its breast, in order to enable the young to obtain the fish, which action, in all probability, gave rise to the fable of the Pelican feeding its young with its own blood. The red tip of the bill probably aided the deception.

Although a web-footed bird, the Pelican, like the Cormorant, can perch on trees, although it prefers sitting on rocks. The color of this bird is a pure white, with a very slight tinge of rose-color, and the pouch is yellow. Its length is nearly six feet.

REPTILES.

WE now arrive at the singular Class of Reptiles. The animals of this class vary exceedingly in their forms, sizes and habits, but the peculiar formation of the circulatory system, together with many other anatomical distinctions, plainly mark them out as a distinct class.

The LIZARDS are usually active, bright-eyed little creatures, delighting to bask in the sun, near some safe retreat, to which they dart with astonishing celerity upon the slightest alarm. The SAND LIZARD is considerably larger than the Common Lizard, as it sometimes measures a foot in length. It frequents sandy heaths, and in the sand its eggs are deposited—fifteen in number. The eggs are hatched by the heat of the sun, and the young immediately lead an independent life. During the winter this as well as the Common Lizard hibernates in a burrow usually made under the roots of a tree, nor does it again make its appearance until the spring.

It is only six inches in length. It is more active than the Sand Lizard, disappearing like magic on being alarmed. When seized, its tail frequently snaps off like glass. Both feed on insects.

The BLIND-WORM is not a snake, as generally supposed, but a legless lizard of the Skink family. It is perfectly harmless; its small mouth and very minute teeth precluding all attempts to injure, even if it had the will. When alarmed, it snaps asunder at the slightest blow, like the tail of the Common Lizard, and from that peculiarity has derived its name "fragilis." It feeds almost entirely on small slugs, its jaws not being capable of admitting any

larger prey. It is very common, and may be seen basking in the sun in hedgerows or under old walls. Its eyes are very small, but brilliant.

The IGUANA family is a very large one, containing 150 species. The Common Iguana is a native of Brazil, Cayenne, Jamaica, etc. In spite of its repulsive appearance, it is with many people a favorite article of food, and is said somewhat to resemble chicken. It is fierce when attacked, and snaps at its enemies in a most determined manner, often scaring away an intruder by the ferocity of its aspect. It is generally taken by throwing a noose over its head, and dragging it from the branches by main force. It is then immediately killed, as its sharp notched teeth can inflict a disagreeable wound. Sometimes it is hunted with dogs trained to the sport. It attains a considerable size, frequently reaching the length of six feet. It feeds usually on vegetable substances, such as leaves, fruit and fungi; but Iguanas have been seen in the Island of Isabella that feed on eggs, insects and even the intestines of fowls.

The terrible name of FLYING DRAGON belongs to a harmless little lizard, which lives on trees and feeds on insects. The peculiar structure of its body bears a singular resemblance to that of the Flying Squirrel. The first six false ribs are greatly elongated, and support a wing-like expansion of skin, which when stretched serves to bear them up as they skim through the air from one tree to another. While running about on the branches, the so-called wings are folded to the side, but when it wishes to throw itself from the tree, the ribs are raised, and the wings expanded. It is common in Java, India and Borneo.

The CHAMELEON is plentifully found in northern Africa, the south of Spain and Sicily. It lives on trees, but exhibits none of the activity usually found in arboreal reptiles. On the contrary, its movements are absurdly grave and solemn. The whole activity of the animal seems to

be centered in its tongue, by means of which organ it secures flies and other insects with such marvellous rapidity that the ancients may be well pardoned for their assertion that the air formed the only food of the Chameleon. Highly exaggerated descriptions have been given of the changes of color in this animal. The changes are by no means so complete, nor are the colors so bright, as generally supposed.

The power of the Chameleon to move its eyes in different directions at the same time gives it a most singular aspect. Its enormously long tongue can be withdrawn into the mouth when not in use; but when the creature sees a fly within reach, the tongue is instantly darted forth, and by means of a gummy secretion at the tip secures the fly. The whole movement is so quick as almost to elude the eye.

THE peculiar gliding movements of the SNAKES render them excellent types of the reptiles; a word derived from the Latin *repo*, I creep. The extraordinary flexibility of their bodies is caused by the structure of their vertebrae, each one of which fits into one behind it by a ball-and-socket joint, thus allowing freedom of motion in every direction.

The RATTLESNAKE is a native of America. Its name is derived from the loose bony structure at the extremity of its tail, called the rattle, and which by the sound of its movements gives timely intimation of the vicinity of this terrible reptile. Fortunately, its disposition is exceedingly sluggish, and it invariably sounds its rattle when irritated or disturbed. Its bite is inevitably mortal, and death always ensues within a few hours after the wound has been inflicted.

The deadly weapons with which the venomous serpents are armed are two long curved fangs belonging to the upper jaw, and moving on a hinge, by which they lie flat in the mouth when not wanted. An aperture exists in



COMMON RATTLESNAKE.

the point of the fang, by which a poisonous fluid, secreted in a gland at the base of the tooth, is poured into the wound, and, mixing with the blood, rapidly carries its deadly influence throughout the entire system. A physician exhibiting a caged rattlesnake to his friends, approached his hand too near the irritated reptile, who inflicted a wound, and, although every precaution was taken, the bite proved fatal in a few hours.

The inhabitants of those countries where the Rattlesnake lives are not very much afraid of it, as they know that it will be sure to run away directly it hears the approach of human footsteps. It appears that when a man is cutting wood or otherwise engaged in a forest, and hears a Rattlesnake near him, he has no fear, as long as he can keep its rattle going, but directly the sound ceases, the man is rather in dread, not knowing where the animal may turn up next; so he keeps the snake in a constant state of alarm by throwing bits of wood or sticks at the place where the reptile is lying, and on again hearing the sound of the rattle he continues his work in confidence until the snake is silent, when some more missiles are sent in the same direction.

Even when these snakes are ready for a spring they can be avoided by smartly clapping the hands together, or striking the ground with a stick. The snake has the whole powers of its mind bent upon its fatal stroke, and, on hearing such an unexpected sound, it is startled, like a man suddenly waked from sleep, and falls down in its coil again, giving time for its intended victim to escape before it has made up its mind to another assault. Its length seldom exceeds seven feet.

The PUFF ADDER is an inhabitant of Southern Africa. It is a short, thick, flattish snake, of a most sinister and malignant aspect, whose bite will sometimes kill in an hour.

It is the more dangerous, because it has a way of flat-



THE PUFF ADDER.

tening itself upon the ground, so that, when it is lying thus concealed upon the sand, an incautious pedestrian is very likely to tread upon it.

The COMMON VIPER, or ADDER, is the only venomous reptile inhabiting England, nor is its bite nearly so dangerous in its consequences as has been reported. Seldom has the Viper proved mortal; and in all probability, if proper precaution be taken, no case would have been fatal. Viper-catchers employ olive oil as a remedy against the bite, and from all accounts it appears to be a certain preservative against all evil effects. The oil should be heated to produce its full efficacy.

It is asserted that, when danger threatens, the female Viper opens her mouth and permits her brood to hide themselves, but it is by no means an ascertained fact.

Frogs, lizards, mice and other small animals form the food of this reptile.

The enormous BOA-CONSTRICTOR inhabits tropical-America. It is not venomous, but it is not the less dangerous, as the tremendous power of its muscles enables it to crush its prey in the coils of its huge body. In order to procure its food it lies in wait by the side of some river or pool, where animals of all kinds are likely to come to quench their thirst. It patiently waits until some animal draws within reach, when with one spring the Boa fixes its teeth in the creature's head, coils its body round its victim, and crushes it to death. After the unfortunate animal has been reduced almost to a shapeless mass by the pressure of the snake, its destroyer makes preparations for swallowing it entire, a task which it accomplishes, although the slaughtered animal is usually very much larger than the dimensions of the serpent. At last the snake succeeds in swallowing its prey, and then lies torpid for nearly a month, until its enormous meal is digested, when it again sallies forth in search of another.

Even the buffalo has been known to fall a victim to this

fearful serpent, whose length frequently exceeds twenty-five feet.

The COBRA DE CAPELLO is a native of India.

The serpent-charmers invariably use this formidable reptile for their performances. The exhibitors possess several Cobras shut up in baskets, and when commencing their performances the lid of the basket is opened and the snake creeps out. Its course is arrested by the sound of the rude fife that the charmer always carries, and it immediately expands its beautiful though threatening hood, erects its neck and commences a series of undulating movements, which are continued until the sound of the fife ceases, when the snake instantly drops and is replaced in its basket by its master. The charmers appear to be able to discover snakes and to induce them to leave their retreats. Indeed it is rather a singular fact that those travellers who most strongly insist that the snakes thus caught are tame and divested of their fangs appear to forget that even in that case the creatures must have been previously caught in order to deprive them of their weapons. The length of this snake is about five or six feet.

The COMMON RINGED or GRASS SNAKE is a harmless inhabitant of this country, and may be frequently seen or heard gliding along the hedge-banks in search of food. It is easily tamed, and soon learns to know its master. It lives principally on frogs, mice, young birds, newts, etc. It is an excellent swimmer, and from the peculiar construction of its lungs can remain under water for some time. Like all other serpents, the Ringed Snake sheds its skin several times during the year. The entire skin comes off, even the covering of the eyes. A rent opens in the neck, and the snake, by entangling itself in the thick grass or bushes, actually creeps out of its skin, turning it inside out in the effort.

The TORTOISE. The whole of this order is characterized by the complete suit of bony armor with which the ani-

mals are protected. The so-called "shell" is in fact a development of so many bones, and not a mere horny appendage like the coverings of the Armadillo and Manis. The upper shield is called the "carapace," and is united to the under shield or "plastron" by certain bones, leaving orifices for the protrusion of the head and limbs. Most species are able to withdraw their head and limbs completely within the shell, and in some few the orifices are closed by a kind of hinge-joint. The tortoise-shell of commerce is a series of horny plates that cover the exterior of the shield, and is in great request on account of the beautiful wavy markings that are so familiar to our eyes.

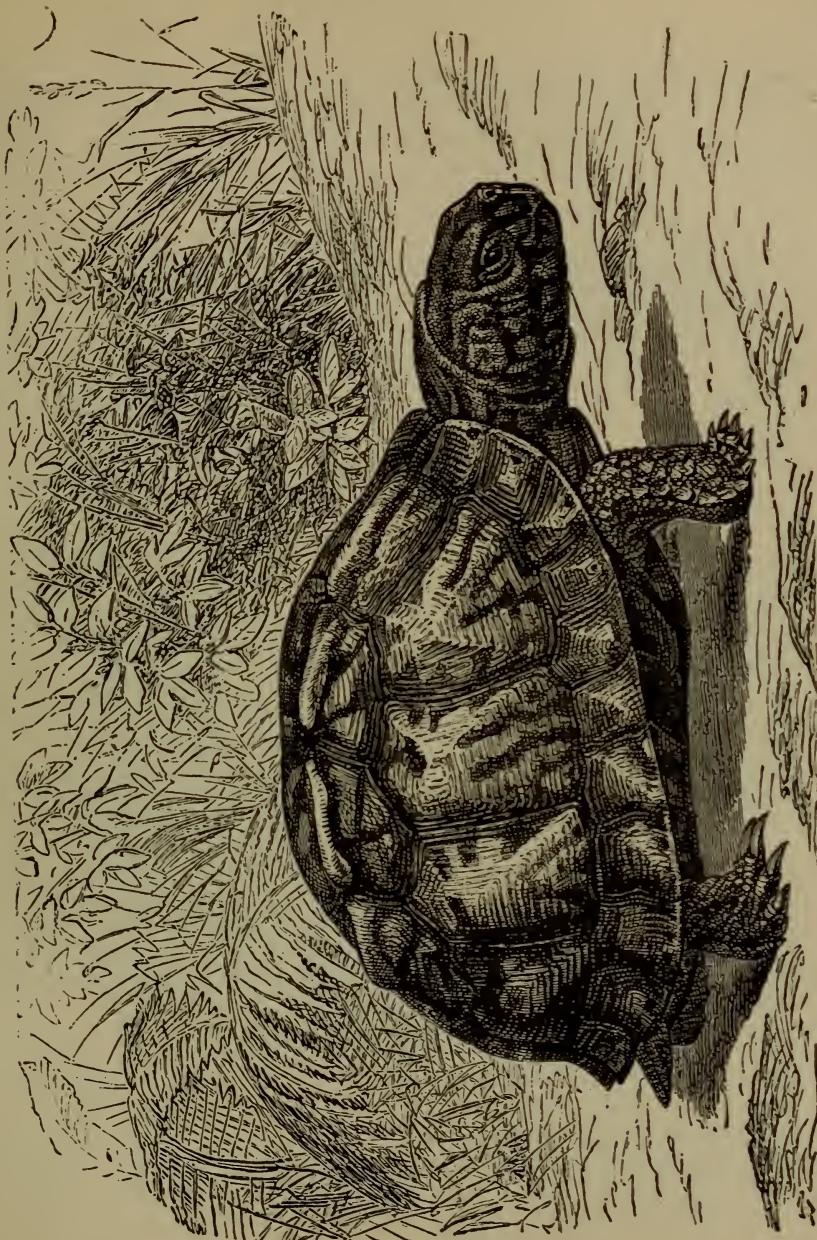
The Tortoises and Turtles possess no teeth, but the sides of their jaws are very hard and sharp, enabling them to crop vegetable substances or to inflict a severe bite.

The family is divided into Land Tortoise, Marsh Tortoise, River Tortoise and Marine Tortoise or Turtles.

The LAND TORTOISE is found in abundance in the south of Europe and in America. It is often kept in captivity in this country, and is very long-lived, individuals being known to have exceeded 200 years. Its movements are very slow, but it can excavate a burrow with unexpected rapidity. Secure in an impenetrable covering, it bids defiance to any ordinary enemy except man and the Boa-constrictor. Man takes him home and roasts him, and the Boa-constrictor swallows him whole, shell and all, and consumes him slowly in the interior.

I had a Land Tortoise for a few months, part of whose life is described in the following passage:

The Tortoise was a very small one, and was tolerably lively, walking about the room and always settling on the hearth-rug. It had a great genius for climbing, and would sometimes spend nearly an hour in endeavoring to scale the fender, probably attracted by the heat. Unfit as the form of the creature may seem for such a purpose, it did



CALIFORNIA BOX TORTOISE.

contrive to scramble upon a footstool which was placed by the fender. Its method of attaining this elevation was as follows: First it reared up against the footstool in the angle formed by it and the fender, and after several ineffectual attempts, succeeded in hitching the claws of one of its hind feet into the open work of the fender. On this it raised itself, and held on to the top of the stool by its fore-feet, while it gained another step on the fender, and so managed to raise itself to such a height that it only had to fall flat on the top of the footstool. When once there it could hardly be induced to leave the elevation which it had gained with such difficulty.

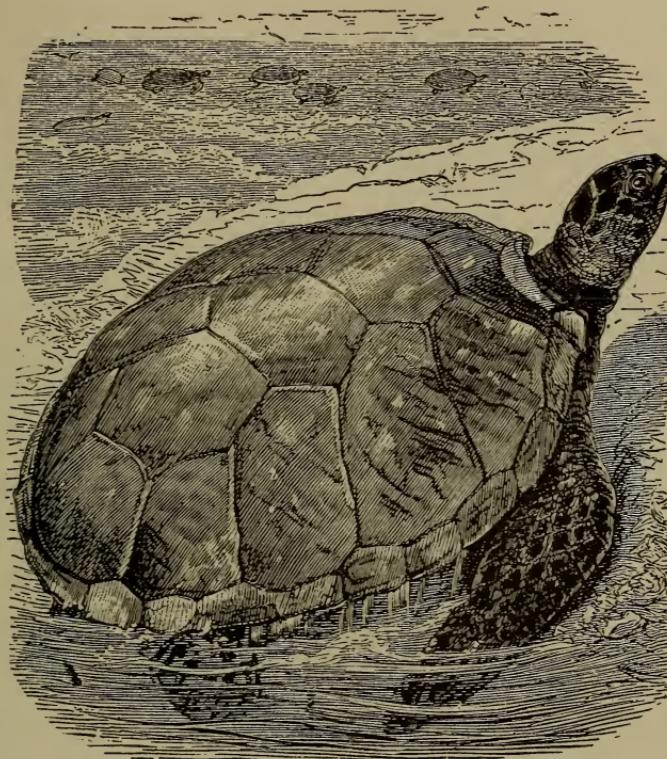
Its food consisted of bread and milk, which it ate several times a day, drinking the milk by scooping up some of it in its lower jaw, and then, by throwing its head back, the milk ran down its throat. Tortoises are generally long-lived, but this animal died within a few months after it came into my possession, in all probability because, for some days, its food was placed in a brass vessel.

The GREEN TURTLE. The feet of the Marine Tortoises, or Turtles, are modified into fins or flippers, just as are the feet of the Seals, and consequently, although the Turtles are active in the water, on land their walk is nothing but an awkward shuffle. The flippers, however, are admirable instruments for scooping out the sand, in which the eggs are laid, and afterwards covered over. Nearly 200 eggs are laid in one nest. The eggs are held in great estimation, but the albumen, or "white," does not become hard by boiling.

The Green Turtle, whose flesh is considered such a luxury, is common in Jamaica and most of the islands of the East and West Indies. The Turtles are captured by turning them on their backs; for the carapace is so flat, and their legs are so short, that they are forced to lie helpless until their captors have leisure to drag them away. The Green Turtle has been known to reach the weight of

600 pounds. The tortoise-shell of commerce is almost entirely obtained from the Hawksbill Turtle.

The CROCODILE. These animals are separated from the



GREEN TURTLE.

Lizards on account of the peculiar horny covering with which they are protected.

The Crocodile is an inhabitant of the Old World, the Alligator of the New, and the two animals are best dis-

tinguished by the construction of the jaws. In the Crocodiles the lower canine teeth fit into a *notch* in the edge of the upper jaw, and there is in consequence a contraction of the muzzle just behind the nostrils. The lower canine teeth of the Alligators fit into a *pit* in the edge of the upper jaw, and in consequence no contraction is needed. At the back of the throat is a valve completely shutting out water, but leaving the passage to the nostrils free, so that the Crocodile can keep his mouth open when beneath the surface, without swallowing the water, or can hold his prey down to drown under the water, while he breathes at ease with his nostrils at the surface. There is no true tongue.

The Crocodile inhabits many African rivers, and is, probably, the reptile infesting the Ganges. The Nile, however, is the best known haunt of this terrible creature. It feeds on fish, floating carrion, and dogs, or other animals, which it is enabled to surprise as they come to drink at the water's edge; but man frequently falls a victim to its voracity. In revenge for this treatment, all nations persecuted with this pest have devised various methods of killing it. The negroes of some parts of Africa are sufficiently bold and skilful to attack the Crocodile in his own element. They fearlessly plunge into the water, and diving beneath him, plunge the dagger with which they are armed into the creature's belly, which is not protected by the coat of mail that guards the other parts of its body. The usual plan is to lie in wait near the spot where the Crocodile is accustomed to repose. This is usually a sand-bank, and the hunter digs a hole in the sand, and, armed with a sharp harpoon, patiently awaits the coming of his expected prey. The Crocodile comes to its accustomed spot, and is soon asleep, when it is suddenly roused by the harpoon, which penetrates completely through its scaly covering. The hunter immediately retreats to a canoe, and hauls at the line attached to the harpoon until he drags

the Crocodile to the surface, when he darts a second harpoon. The struggling animal is soon wearied out, dragged to the shore, and dispatched by dividing the spinal cord. In order to prevent the infuriated reptile from biting the cord asunder, it is composed of about thirty small lines, not twisted, but only bound together at intervals of two feet.



NILE CROCODILE.

When on land it is not difficult to escape the Crocodile, as certain projections on the vertebræ of the neck prevent it from turning its head to any great extent.

The eggs of this creature are very small, hardly exceeding those of a goose; numbers are annually destroyed by birds of prey and quadrupeds, especially the Ichneumon.

The ALLIGATOR is an inhabitant of the New World, and

is common in our southern rivers. It pursues fish with exceeding dexterity, by driving a shoal of them into a creek, and then plunging amid the terrified mass, and devouring its victims at its pleasure. It also catches pigs, dogs, and other animals that venture too close to the river. In that case, as the animal is too large to be swallowed entire, the Alligator conceals it in some hole in the bank until it begins to putrefy, when it is dragged out and devoured under the concealment of the rank herbage fringing the river.

The usual method of taking this creature is by baiting a most formidable four-pointed hook, composed of wooden spikes artistically arranged, and suffering it to float in the river. When an Alligator has swallowed it, he is hauled on the shore by the rope and slaughtered.

Like the Crocodile, the Alligator lays its eggs in the sandy bank of the river. Fortunately, but few of the young ever reach maturity, as their ranks are thinned by various birds and beasts of prey before the eggs are hatched, and by the attacks of large fishes, and even their own species, when they have reached the water.

The appearance and habits of the FROG and the TOAD are so familiar as to require but little description. A short account, however, is necessary of the peculiarities common to both Frogs and Toads.

In the early stage of their existence, these animals are termed tadpoles. They at first appear to be nothing but head and tail, but after several days have passed, four legs are observed to become developed. These rapidly increase, and the little creature closely resembles a small eft. In due time, however, the tail is lost, and the creature becomes a perfect Frog. Another important change also takes place. In its tadpole state the creature was essentially a water animal, but after its change has taken place it is not able to exist under water for any great length of time, and is forced to come to the surface to breathe.



MISSISSIPPI ALLIGATOR.

The tongue of the Frog is curiously fixed almost at the entrance of the mouth, and when at rest points backwards down the throat. When, however, the Frog comes within reach of a slug or insect, the tongue is darted out with exceeding rapidity, the slug secured, carried to the back of the throat, and swallowed.

Both Frogs and Toads hibernate, the former congregating in multitudes in the mud at the bottom of ponds and marshes, while the latter choose a hole in the ground, frequently at the roots of a tree, and pass the winter in solitary dignity.

The skin of these animals has the property of imbibing water, so that if an apparently emaciated Frog is placed in a damp place, it will soon look quite plump.

The Common Frog is a well-known frequenter of marshy places and the banks of rivers. It is an admirable swimmer, and from the peculiar construction of its lungs can remain for some time under water, but is forced periodically to come to the surface for the purpose of breathing.

The Bull-Frog is an inhabitant of North America. It is very voracious, feeding upon fishes, mollusks, and even young fowl. Its powers of leaping are so great that an Indian was not able to overtake an irritated Bull-Frog after it had sprung three hops in advance. It is very large, measuring about seven inches in length.

The Tree Frogs are very peculiar animals. The construction of their feet, something resembling that of the geckos, enables them to traverse the branches, and even to hang on the under surface of a pendant leaf, which it so resembles in color that the unwary insect passes by and is instantly seized by the watchful frog. The Green Tree Frog is the most common, and is plentifully found in southern Europe and northern Africa. There are several specimens in the Zoological Gardens, which present a most absurd appearance as they stick against the pane of glass forming the front of their cage.

The Toad has had its full share of marvellous tales. Its poisonous properties are celebrated in many an ancient chronicle, as are also the virtues of the jewel contained in its head.

Its skin certainly does secrete an acrid humor, which defends it from dogs, who can seldom be induced to bite a Toad a second time.

The Toad is easily tamed. I have known one that lived in the family for several years, and was accustomed to sup on a lump of sugar.

The well-known instances of imprisoned Toads who must have spent many years in their narrow habitations are apparently explained by the supposition that some aperture or fissure existed, through which air and minute insects could pass, sufficient for their nourishment while in a semi-torpid condition. Those experimented on by Dr. Buckland, and from whom all air was cut off, died before a year's imprisonment. The Toad casts its skin at certain times, but we never find the slough, as we do that of the snake, as the Toad invariably swallows its former covering.

Our last example of this large and interesting family is the CROWNED TAPAYAXIN, one of the singular North American reptiles which are popularly known by the name of Horned Toads, their general form and mode of sitting being extremely toad-like.

This animal is not at all uncommon in California, and is said when at liberty in its wild state to move with much rapidity over the ground in search of its insect prey. Its habits in confinement, however, do not carry out this statement, as it is then sluggish to a degree, remaining for many consecutive hours in precisely the same attitude, heedless of the falling rain or the burning rays of the sun, and scarcely changing its position even when pushed with the finger. It is quite harmless, in spite of its very formidable looks, and does not attempt to avenge itself upon its captor, however roughly it may be handled. After a while

it can be made to know its owner, and it will even take flies and other insects out of his hand. Little red ants seem to be its favorite food, but it lives on beetles and insects of various kinds.

I possessed for some time one of these Lizards, which was sent by *post* from Brazil, and arrived in very good health. It was kept in a box partly filled with sand, and seemed to have but two phases of existence—either lying so motionless as scarcely to be distinguishable from the sand, or darting about so quickly that the eye could hardly follow its movements. A specimen which my brother had in Brazil was quite tame, and used to run in and out of the house as it liked. It had a habit of sitting on a box, watching the floor, and whenever a fly settled, jumping down on it with unerring certainty of aim.

The head of this curious reptile is armed with long, pointed, conical spines, set around its edge and directed backward. Shorter and stouter spines, but of a triangular shape, are scattered over the back, and extend even over the odd, short and pointed tail. Each edge of the tail is armed with a strong row of spines, giving it a regularly toothed appearance. The general color of the Crowned Tapayaxin is gray, variegated with several irregular bands of rich chestnut-brown. The head is light brown, blotched with a darker hue, and the under parts are ochry yellow, marked with sundry blotches of dark gray.

The NEWTS are separated from the Lizards on account of their changes while young. Like the Frogs, they are first tadpoles, and do not assume their perfect shape until six weeks after their exclusion from the eggs.

The Newt is a beautiful inhabitant of the ponds, ditches and still waters. It feeds principally on tadpoles and worms, which it eats with a peculiar rapid snap. I have frequently seen it attack the smaller Newt with great perseverance, but I never saw it kill its prey.

I kept some Newts for some time in a large glass vessel,

and noticed that when a new inhabitant was added, it always cast its skin within two or three days. The skin came off in pieces, the covering of the feet slipping off like a glove, but I could never see how the creature contrived to pull these glove-like relics off.

It is constantly in the habit of rising to the surface of the water in order to breathe.

The Newt has received the name of *Cristatus*, or crested, on account of the beautiful crimson-tipped wavy crest of loose skin that extends along the whole course of the back and tail, and which, together with the rich orange-colored belly, makes it a most beautiful creature. The female has a singular habit of laying her eggs upon long leaves of water-plants, and tying them in the leaf by a regular knot.

The *PROTEUS* is an extraordinary animal, which has been found in dark subterranean lakes, many hundred feet below the surface of the earth, where no ray of light can possibly enter. The eyes of this singular creature are mere points covered with skin, and useless for vision; indeed, when in captivity, it always chooses the darkest part of the vessel in which it is confined.

I have seen seven specimens of this strange creature, which have lived for several years in a glass vessel covered with green baize in order to keep them in the dark. They have not been known to take any nourishment whatever during the time of their captivity, except the very trifling amount of nutrition that might have been obtained by changing the water.

The *Proteus* breathes in two ways—by lungs and by gills; the latter organs appearing in the form of two tufts, one on each side of the neck, just above the fore limbs. The circulation of the blood in these branchial tufts can easily be seen with a microscope. Exposure to light darkens the tints both of gills and body. It has been proved to be a perfect animal, and has been found of all sizes.

The blood-disks of this animal are exceedingly large, so large, indeed, as almost to be distinguished by the naked eye. When in captivity, its movements are slow and eel-like, nor does it seem to make much use of its almost rudimentary limbs.



THE PROTEUS.

It has usually been found on the soft mud of a small lake in the grotto of Maddalena, at Adelsburg; they have also been found at Sittich, thirty miles distant, thrown up from a subterranean cavity.

INSECTS.

The TIGER-BEETLE.—The body of an insect is divided or *cut into* three parts, called the head, the thorax, and the abdomen. The body is defended by a horny integument,



TIGER-BEETLES.

divided into rings, and divided by a softer membrane. The legs are six in number. Many insects possess wings, and in all the rudiments of those organs are perceptible. The eyes are compound, that is, a number of eyes are massed together at each side of the head; and so numerous are they that in the compound eye of the Ant are fifty

lenses, in the House-fly 8,000, in the Butterfly 17,000, and in the Hawk-moth 20,000.

The insects pass through three transformations before they attain their perfect form. The first state is called the *larva*, because the future insect is masked under that form; the second is called the *pupa*, on account of the shape often assumed; and the third is called *imago*, as being the image of the perfect creature. Insects breathe by means of air-tubes which penetrate to every part of the body, even to the extremities of the limbs, antennæ and wings. The air gains access to the tubes by means of small apertures called *spiracles*. The tubes are prevented from collapsing by a delicate thread wound spirally between the two membranes of which the tubes are composed. This wonderful and beautiful arrangement not only prevents the tubes from collapsing, but keeps them flexible. There are, according to Stephens, fourteen orders of insects. Examples will be given of each and their names explained. The most perfect insects are placed first.

There are two great divisions of insects, namely, those which bite and eat solid food with jaws, as the Beetles, Locusts, Bees, etc., and those which suck liquid food through a proboscis, as the Butterflies, Flies, etc. The first order of insects derives its name from the sheath or covering with which the wings are defended. This is a very extensive order. The first in order are the Tiger-beetles, so called from their activity and voracity. The most common of these is the ordinary Green Tiger-beetle that may be seen any hot summer's day glancing in the sun on sandy banks. The beauty of this insect is beyond description. The upper surface of the body is a deep, dead green, changing under the microscope to a glossy gold, shot with red and green; the surface of the abdomen covered by the wings and the entire under surface of the body are brilliant emerald green, and when the insect is on the wing it sparkles in the sun like a flying gem. When

handled it gives forth a scent closely resembling that of the verbena. It is indeed as beautiful among insects as the tiger is among beasts, and is perhaps the more ferocious of the two. It runs and flies with great activity, and takes to its wings as easily as a bee or fly, and is, in consequence, difficult to capture without a net. Its jaws are long, sharp, curved like a sickle, and armed with several teeth. Its eyes are large and prominent, enabling it to see on all sides. Its length is rather more than half an inch.

The GROUND-BEETLE is one of the largest and most beautiful beetles. Its general color is a coppery-green, and its wing-cases are ornamented with several rows of oblong raised spots. Its length is about an inch.

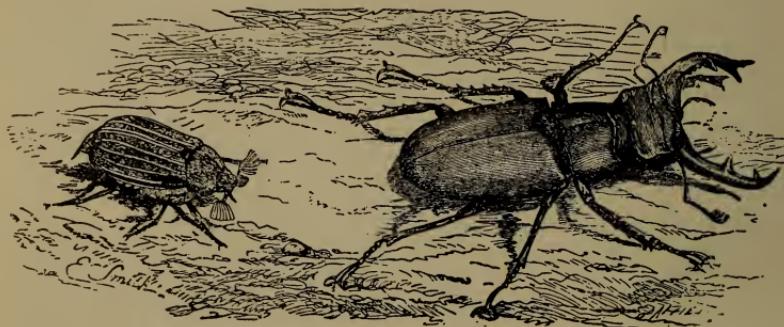
The LAMELLICORN BEETLES are exceedingly useful to mankind. Many of them act as scavengers and farmers, for they not only remove putrefying substances from the surface of the ground, but bury them beneath.

The DOR-BEETLE is a very common insect. At the approach of evening it may be seen whirling around in the air with a dull, humming sound. The country children call it the Watchman, comparing it to the watchman going his rounds in the evening. It usually lays its eggs on a rounded mass of cow-dung, and then buries the whole mass in the ground. When caught, it pretends to be dead.

The STAG-BEETLE is the largest of insects. Although so formidably armed it is quite harmless, and only uses its enormous jaws to break the tender bark of trees in order that the sap on which it feeds may exude. The mouth of this beetle is very small, and is furnished with a brush, with which it licks up the food. Several of these beetles lived for some months on moist sugar. During the winter it hides in the earth, making for itself a kind of cave, very smooth inside. This beetle is common in Germany.

The COCKCHAFFER needs little description. Its larva

works great mischief during the spring, as it feeds on the roots of plants, and cuts them off with its sharp, sickle-like jaws. Where many of these "grubs" have been, the grass curls up, and dries like hay. Fortunately the thrushes, blackbirds, rooks, and many other birds, are inveterate destroyers of the grubs, and devour myriads of them. It is for this purpose that these birds pull up the grass, and not to spoil or devour the herbage, as is generally supposed.



COCKCHAFFER—STAG-BEETLE.

The huge Hercules and Atlas Beetles, and, larger still, the Goliath Beetle, belong to the Lamellicorns.

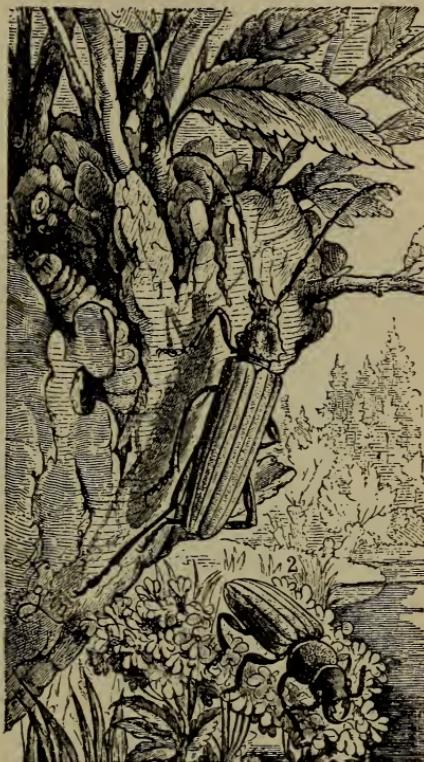
The GLOWWORM may be seen in the warm summer evenings, shedding its pale-green light on the grassy banks. The female insect gives out a much stronger light than the male, and there is some light visible even in the larva. The light of this insect proceeds from the abdomen. The light given out by the Firefly, another kind of beetle inhabiting South America, proceeds from three yellow tubercles placed on the throat. The grub or larva of the Glow-worm is of a singular form, and is furnished with a brush at the extremity of the tail, with which it cleanses its body

from dust or the slime of the snails on which it frequently feeds.

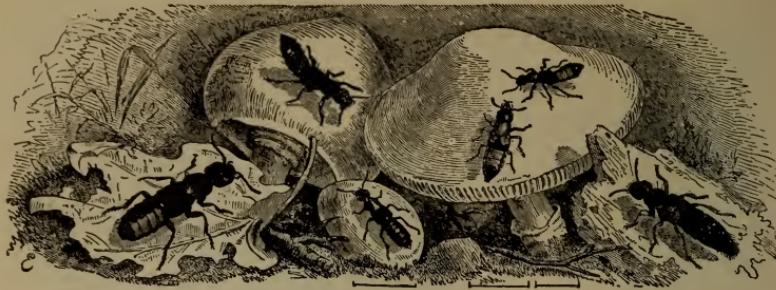
The MUSK-BEETLES vary considerably in size, some being several inches in length, while some are hardly one-quarter of an inch long. The extreme length of their antennæ is the most conspicuous property, and from that peculiarity they are at once recognized.

It is a large insect, and is usually found in old willow-trees. Its peculiar scent, something resembling that of roses, often betrays its presence when its green color would have kept it concealed. When touched it emits a curious sound, not unlike that of the bat, but more resembling the faint scratching of a slate-pencil. Its larva bores deep holes in the trees, which are often quite honey-combed by them.

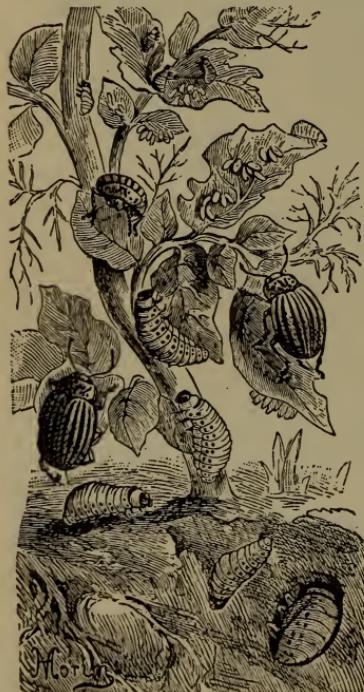
The ROVE-BEETLES form an extensive section. Some are so small as to require the assistance of the microscope to discover their shape, and others are more than an inch in



MUSK-BEETLE.



ROVE-BEETLES.



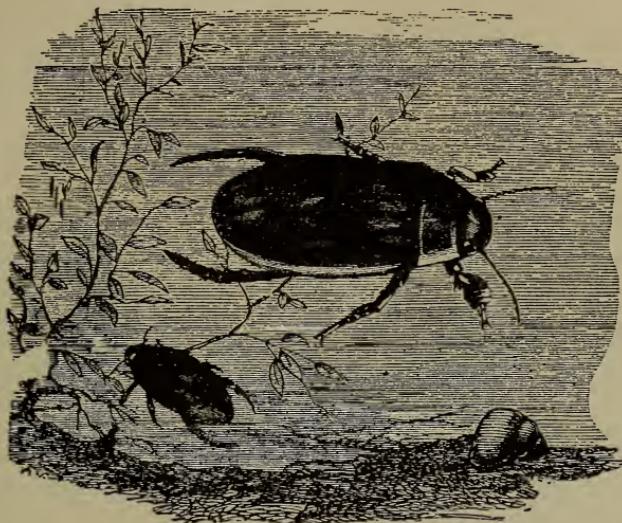
COLORADO POTATO-BEETLE IN ALL ITS STAGES (Natural Size).

length. The small species are usually on the wing, and it is very amusing to see them alight, and with their flexible tails tuck their long and beautifully-shaped wings under the elytra, run about for a moment, and then again take to flight. These are the creatures that cause so much annoyance by flying into one's mouth or eye in the warm and sultry months.

The GREAT ROVE-BEETLE is commonly found upon decaying animal substances. It is most formidable armed with two large, curved, sharp mandibles, the bite of which is tolerably severe, and more than once, when the creature has been recently

feeding upon putrid substances, dangerous results have followed.

WATER-BEETLES inhabit the water and swim with activity. They occasionally come to the surface for a fresh supply of air, which they carry down between the elytra and the upper surface of the abdomen. They fly very



WATER-BEETLES.

well, but the construction of their limbs prevents them from walking. They cannot be kept in a limited space, as they are very fierce and voracious, and in one case, when a male and female were placed in a jar filled with water, only one day elapsed before the male was found dead and half devoured by his disconsolate widow.

The EARWIG is placed in an order by itself. The wings are large and beautiful, and the method of folding by

which they are packed under the very small elytra is very curious. The use of the forceps is for the purpose of folding the wings and placing them in their proper position under their cases. Its eggs are hatched and the young protected by the parent.

The LOCUST. These pests of the warmer countries of the earth fly in countless myriads, and where they descend they devour every particle of green herbage—the trees are stripped of their leaves, the grass and corn are eaten to the very ground; for their jaws are so strong as to inflict a severe wound when the insect is incautiously handled. Nor does the mischief end with their life, for their dead bodies often accumulate in such numbers that the air is even dangerously infected. They infest America, Africa and Central Asia, but they annually make incursions to Europe, where the damage they occasion is much less reparable than in their native lands; for there the power

of vegetation is so great that a few days repair the injuries caused by them, but in Europe a whole year is required for that purpose. Our Grasshoppers belong to this order.

The HOUSE CRICKET delights to live in places that are always warm, and is found swarming about ovens, kitchen fire-places and localities of a similar nature. It makes its residence by cutting away the mortar with its powerful jaws, and so effectually will it do so that it sometimes eats completely through the wall, opening communications between



HOUSE CRICKET.

two or more houses. The manner in which it bears heat is wonderful, as it will live within a few inches of a fierce fire.

The heat of the atmosphere in which it lives renders it very liable to thirst, and it seeks every opportunity of quenching its thirst by gnawing holes in wet linen, devouring any moist crumbs that may lie on the floor, or boldly climbing the milk-pan, in which latter case it gets a little too much liquid, and is generally "found drowned" next morning.

The wings of this insect, as well as those of the Field Cricket, are very beautiful, and marked with an elegant pattern. The Cricket never appears to use them except at night, when it may be taken on the wing.

The curious insect called the MOLE CRICKET is not uncommon. It inhabits sandy banks, digging deep holes and forming chambers, in which its eggs are laid. The forelegs closely resemble those of the Mole, and are used for the same purpose.

The LEAF INSECT is an inhabitant of South America.

It resembles a leaf in shape and in color, and its legs may easily be mistaken for dry twigs. Even the ramified veinings of the leaf are preserved on its wings. It is singular that while some insects closely resemble vegetables, some vegetables, as the Orchidaceæ, should as closely resemble insects. Nearly connected with this insect is the Praying Mantis, so called from the curious manner in which it holds its forelegs. It is very voracious and quarrelsome, fighting with its forelegs, which it uses like a sword. In China the inhabitants keep them in cages, and set them



FIELD CRICKET.

to fight as in other countries certain barbarians keep cocks for the same purpose.

The COCKROACH has suffered under the hand of housewives, who express their abhorrence of it under the name of "black beetle." It is not black, it is not a beetle, and its color is a mahogany red. But, red or black, beetle or not, it is a very great plague, and fully deserves all the maledictions heaped upon it.

Its unpleasant character has caused innumerable plans to be laid for its destruction. Among these, strewing the ground with the peel of cucumber or with red wafers is said to be effectual in destroying the Cockroaches, but perhaps no plan is so successful as the glass pan with sloping sides, which lets the insects fall in but prevents their escape altogether.

The eggs of the Cockroach are deposited, indeed, in little cases or purses, something like those of the shark, but without the strings. Down one side a thick-toothed ridge runs, and by this ridge the young escape when hatched.

The male Cockroach is furnished with very handsome wings, while the female is entirely destitute of these organs, and only possesses four little scales to mark their position.

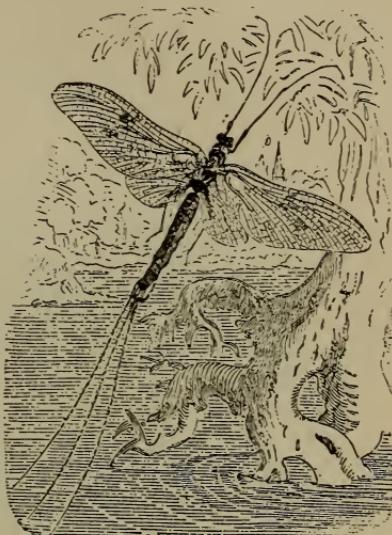
The COMMON MAY-FLY is so well-known an insect that it needs no long description. It is the fly so familiar to anglers under the name of the "Drake." It is to be found in swarms in the beginning of June, rising and falling in the air in its peculiarly undulating manner.

The May-fly spends the first portion of its existence in the water under the shape of a longish grub, with leaf-like appendages to its tail. About May the grubs may be seen to leave the water and to crawl up the banks or climb the stems of aquatic plants. The skin then splits, and the May-fly creeps out. But it cannot immediately fly, as its wings are soft and like two split peas. A short

interval of exercise in the open air soon loosens them, and they are gradually shaken out until they have attained their full size, when the insect flies off. There is, however, another change yet. In a short time the insect again settles, and sheds the entire skin a second time, even including the covering of the wings. These cast skins are often found sticking on the bark of willow-trees by the side of waters, and are mistaken for dead May-flies.

Well do the DRAGON-FLIES deserve their name. Fierce, voracious, active and powerful, they are a scourge to the insects. They are on the wing nearly the whole day, seizing and devouring flies, spiders, and various insects; nor can even the broad-winged butterfly escape them. So voracious are they that when held in the hand they will devour flies, etc., if held within their reach, and they have even been known, when their bodies have been severed in two, to eat flies, although they had no stomach to put them in. I once caught a Dragon-fly in my net, and while holding it by the wings I presented to it no less than thirty-seven large flies in rapid succession, all of which it devoured, together with four long-legged spiders. It would probably have eaten as many more, had I not been tired of catching flies for it.

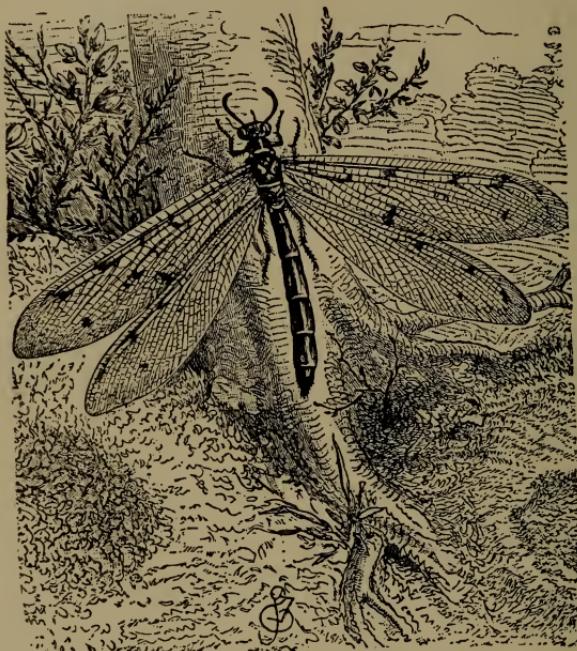
The larva of the Dragon-fly inhabits the water, and is



MAY-FLY.

quite as voracious as in its perfect state. Affixed to its head is a curious set of organs, called the mask, which it can extend, and use for the purpose of seizing its prey and holding it to its month.

The ANT-LION, in its perfect form, although it is very elegant, exhibits no peculiarity worthy of notice, but in its



ANT-LION.

larva state its habits are so extraordinary as to have excited general attention. As it is slow and awkward in its movements, it has recourse to stratagem for capturing the agile insects on which it feeds. Choosing a light, sandy

soil, it digs for itself a conical pit, at the bottom of which it conceals itself, leaving only its jaws exposed. When an unwary insect approaches too near the edge of the pit the sand gives way, and down rolls the insect into the very teeth of the concealed Ant-Lion, who instantly pierces its prey with its calliper-shaped fangs and sucks out its juices through the jaws, which are hollow. Should, however, the Ant-Lion miss its prey, and the insect endeavor to escape, its captor instantly makes such a turmoil by tossing up the sand with its closed jaws and covering each side of the pit with the moving grains that the insect is tolerably certain to be brought down to the bottom, and is seized by the Ant-Lion, who immediately drags it below the sand. When the insect is very strong, and struggles hard to escape, the Ant-Lion shakes it about as a dog does a rat, and beats it against the ground until it is disabled.

The TERMITES or WHITE ANTS, as they are very erroneously called, are not ants at all. These insects live in large societies and build edifices, sometimes of enormous size, and almost as hard as stone. Twelve feet in height is quite common, so that were we to compare our works with theirs, the Capitol at Washington falls infinitely short of the edifices constructed by these little creatures. The common Termite inhabits Africa. Not only does it build these houses, but runs galleries underground, as, curiously enough, though blind, it works either at night or in darkness. In each house or community there are five different kinds of Termites:—1, the single male, or king, whose life is very short; 2, the single female, or queen. These are the perfect insects, and have had wings, but have lost them soon after their admission into their cell; they also have eyes; 3, the soldiers or fighting men: these possess large jaws, do no work, but repel adversaries and watch as sentinels; 4, the pupæ, who resemble the workers, except that they possess the rudiments of wings; and, 5, the larvæ, or

workers. These do all the *work*, i. e., they collect food, attend to the queen, and watch over the eggs and young, and build and repair their castle. These are more numerous than all the other kinds.

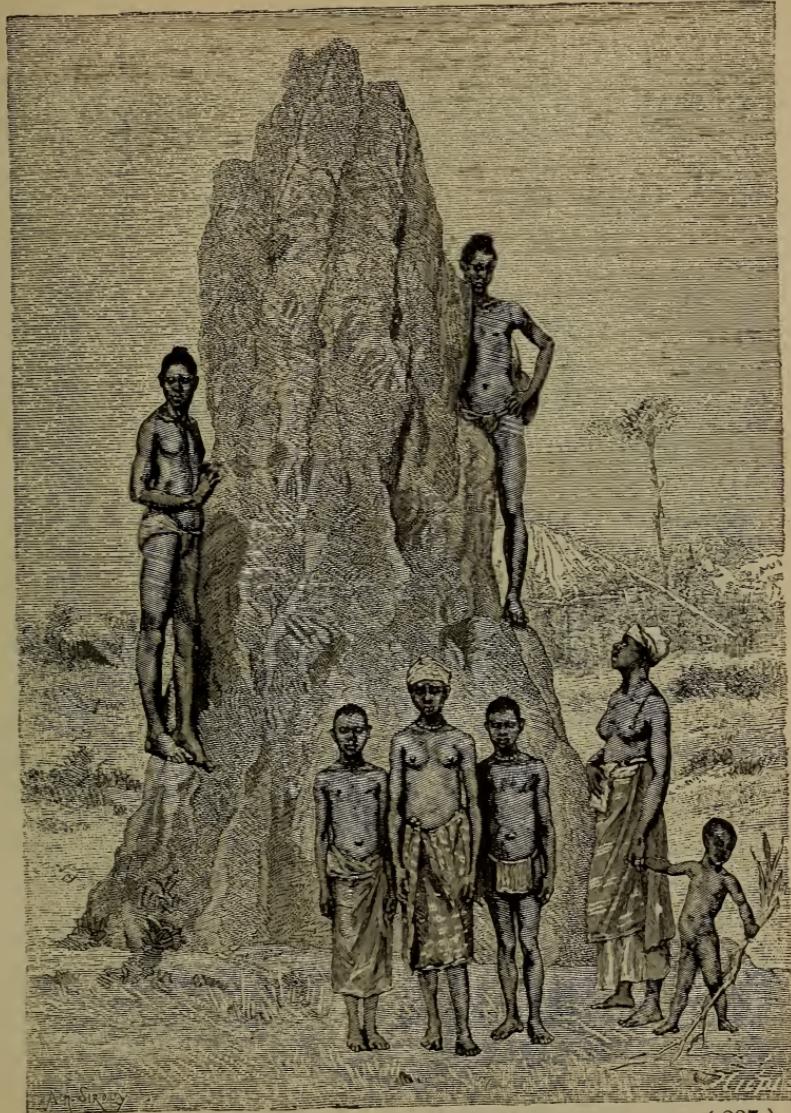
On the approach of the rainy season the pupæ obtain wings and issue forth in swarms. Few, however, survive. Myriads are devoured by birds, reptiles, and even by man, and many are carried out to sea and perish there. Those that do escape are speedily found by the laborers, who inclose a pair in a cell, from which they never emerge. The male soon dies, but the female, after rapidly increasing to nearly three inches in length and one in breadth, continues to lay eggs unceasingly for a very long time. This cell becomes the nucleus of the hive, and around it all other cells and galleries are built.

These insects are terribly destructive, as they eat through wooden beams, furniture, etc., leaving only a thin shell, which is broken down with the least extra weight; and many are the occasions when an unsuspecting individual, on seating himself on an apparently sound sofa or chair, finds himself, like Belzoni in the pyramid, reposing among a heap of dust and splinters.

Mr. Cumming describes the habitations of the White Ant in these terms:—

“Throughout the greater part of the plains frequented by blesboks, numbers of the sun-baked hills or mounds of clay formed by white ants occur. The average height of the ant-hills in these districts is from two to three feet. They are generally distant from one another from one to three hundred yards, being more or less thickly placed in different parts. These ant-hills are of the greatest service to the hunter, enabling him with facility to conceal himself on the otherwise open plain.”

The CADDIS-FLY is well-known to every angler, both in its larva and in its perfect state. The larva is a soft white



TERMITES: AN ANT HILL.

worm, of which fishes are exceedingly fond, and it therefore requires some means of defence. It accordingly actually makes for itself a movable house of sand, small stones, straws, bits of shells, or even small living shells, in which it lives in perfect security, and crawls about in search of food, dragging its house after it. When it is about to become a pupa it spins a strong silk grating over the entrance of its case, so that the water necessary for its respiration can pass through, but at the same time all enemies are kept out. When the time for its change has arrived the pupa bites through the grating, rises to the surface, and crawls out of reach of the water which would soon be fatal to it. The skin then splits down its back and the perfect insect emerges.

The ICHNEUMON-FLY.—We have now reached a most important and interesting order. In it are contained the Bees, Wasps, Ants, etc. This is the only order where the insects possess stings. The wings are four in number, with certain veinings upon them, the shape and number of which in many cases distinguish the species.

The ICHNEUMONS form a very large section. They are



CADDIS-FLY.

most useful to mankind, as one Ichneumon will destroy more caterpillars than a man could kill in his lifetime. They do not, as most other insects, deposit their eggs upon vegetable or dead animal substances, but they actually bore holes in other insects, while they are still in the larva state, and leave the eggs to hatch in their living receptacle. The most common Ichneumon is a very small insect, not so large as an ordinary gnat. This little creature may be seen searching for caterpillars. It generally selects the common cabbage caterpillar, and, sitting upon it, pierces with its sting the skin of the caterpillar, and deposits an egg. After repeating this operation many times it flies off, and the caterpillar proceeds as before in the great business of its life, that is, eating, and continues in apparently perfect health until the time for its change into the chrysalis state occurs. The good condition of it, however, is merely deceptive, for the offspring of the little Ichneumon have all this while been silently increasing in size, and feeding on the fat, etc., of the caterpillar, but cautiously avoiding any vital part, so that the plump appearance of the caterpillar is merely produced by the young Ichneumons lying snugly under the skin. Just as the caterpillar commences its change, out come all the Ichneumons, looking like little white maggots, and immediately each spins for itself a yellow oval case, frequently enveloping the form of the now emaciated caterpillar. In a few days a little lid on the top of each case opens, and the perfect flies issue forth, and immediately commence their own work of destruction.

I have examined hundreds of caterpillars in the course of dissection, and have seldom found them free from Ichneumons. I took out of one small goat caterpillar 137 of these insidious destroyers. I found them useful auxiliaries in dissection, as they had usually consumed all the fat, leaving the important organs ready cleared.

The Wood Ant is found principally in woods, and

builds a nest of sand and earth, intermixed with bits of sticks, leaves, etc. The interior of this hill is chambered out into a variety of apartments, and is traversed by passages. The so-called ants' eggs are not eggs at all, but the *pupa* cases of the insect, and if opened, the perfect insect is seen curled up inside. In the autumn the Ants burst forth by thousands, and may be seen hovering in clouds above the nest. Their beautiful wings do not last long, for when a female Ant escapes, and finds an infant colony, her wings are soon lost, just as a highly-accomplished young lady gives up her velvet painting and cross-stitchery when she marries and has a large family. Few *do* escape, as the birds find these living clouds a most agreeable and plentiful repast.

Ants do not, as has been so frequently said, lay up stores of corn for the winter, for they are in a state of torpidity during the cold months, and require no food. Moreover,

an Ant would find as much difficulty in eating or digesting a grain of corn as we would in devouring a truss of straw.

In each nest are three kinds of Ants—males, females and neuters, or workers.



WASP.

Let us honor the WASPS as the first papermakers, for of that material is the nest composed. The paper is rough and coarse, certainly, but it is still paper. The Wasp, in order to make this paper, rasps off fibers of decayed wood, which it afterwards mashes with its teeth into a pulp, and then spreads the pulp in layers, when it ultimately hardens and forms coarse paper.

The dreaded HORNET is usually found in woods, where it builds its nest in the hollows of trees. A deserted hut is a favorite spot, and when occupied by a full nest of hornets is not particularly safe to enter, as the sting of this insect is peculiarly severe.

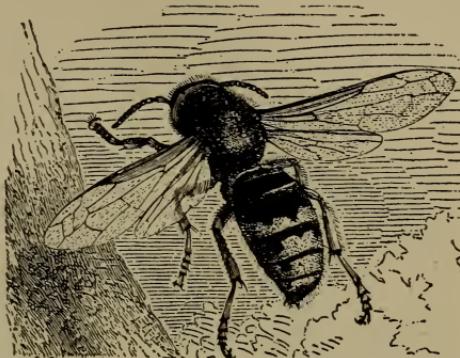
It feeds upon other insects, and even attacks and devours the formidable wasp.

The COMMON WASP builds its nest in the ground, usually in banks. The comb is laid horizontally, and not vertically like those of the bee. As the cells are made of paper, they will not hold honey, nor does the Wasp endeavor to collect honey, although it is very fond of it, and never loses an opportunity of robbing a bee-hive, although its natural food is flies or other animal substances. Nor does it despise sugar, as every grocer's window testifies. Very few Wasps survive the winter, and those that do immediately set about forming a new nest. Only a few cells are made at first, but the number rapidly increases, until the nest is furnished with about sixteen thousand cells.

Some Wasps build nests upon the branches of trees, and others suspend them from the branches.

The BEE is so well known that a lengthened description of it would be useless. A merely general sketch will be quite sufficient.

The cells of the Bee are, as is well known, made of wax. This wax is secreted in the form of scales under six little



HORNET.

flaps situated on the under side of the insect. It is then pulled out by the Bee, and molded with other scales until a tenacious piece of wax is formed. The yellow substance on the legs of the Bees is the pollen of flowers. This is kneaded up by the Bees, and is called bee-bread.

The cells are six-sided, a form which gives the greatest space and strength with the least amount of material, but

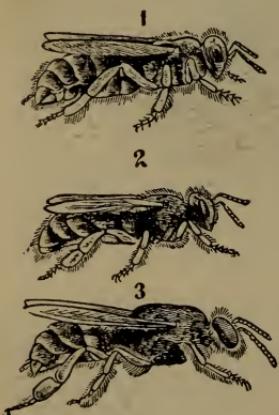
the method employed by the Bees to give the cells that shape is not known. The cells in which the drone or male Bees are hatched are much larger than those of the ordinary or worker Bee. The edges of the cells are strengthened with a substance called propolis, which is a gummy material procured from the buds of various trees. This propolis is also used to stop up crevices and to mix with wax when the comb has to be strengthened.

The royal cells are much larger than any others, and are of an oval shape. When a worker larva is placed in a royal cell, and fed in a royal manner, it imbibes the prin-

ciples of royalty and becomes a queen accordingly. This practice is adopted if the queen bee should die and there be no other queen to take her place.

The queen Bee is lady paramount in her own hive, and suffers no other queen to divide rule with her. Should a strange queen gain admittance there is a battle at once, which ceases not until one has been destroyed.

At the swarming-time the old queen is sadly put out by the encroachments of various young queens, who each wish for the throne, and at last is so agitated that she rushes out of the hive, attended by a large body of sub-



1, MALE; 2, FEMALE;
3, DRONE.



GROUP OF BUTTERFLIES.

jects, and thus the first swarm is formed. In seven or eight days the queen next in age also departs, taking with her another supply of subjects. When all the swarms have left the original hive, the remaining queens fight until one gains the throne.

The old method of destroying Bees for the sake of the honey was not only cruel but wasteful, as by burning some dry "puff-ball" the Bees are stupefied, and shortly return to consciousness. The employment of a "cap" on the hive is an excellent plan, as the Bees deposit honey alone in these caps, without any admixture of grubs or bee-bread. Extra hives at the side, with a communication from the original hive, are also useful.

The queen Bee lays about 18,000 eggs. Of these about 800 are males or drones, and four or five queens, the remainder being workers.

BUTTERFLIES are usually lighter in the body than Moths, from which insects they are easily distinguished by the shape of the antennæ, which in the Butterflies are slender and terminate in a small knob, but in the Moths terminate in a point, and are often beautifully fringed.

The SWALLOW-TAILED BUTTERFLY flies with exceeding rapidity, nearly in a straight line, and is very difficult to capture.

The color of the wings is black, variegated most beautifully with yellow markings, and near the extremity of each hinder wing is a circular red spot, surmounted by a crescent of blue, and the whole surrounded by a black ring.

The RED ADMIRAL is one of the most gorgeous of Butterflies. The color of the wings is a deep black, relieved by a broad band of scarlet across each, and a series of semicircular blue marks edge each wing. It is usually found in woods and lanes, where there are nettles, as the larva feeds upon that plant. It appears about the middle of August.

The DEATH'S-HEAD MOTH not unfrequently measures nearly six inches across the wings. Its rather ominous name is derived from the singular marking in the thorax, which does not require much imagination to represent a skull and cross-bones.



HAWK-MOTH—DEATH'S-HEAD MOTH.

Some naturalists have asserted that this Moth makes its way into bee-hives and robs the inhabitants of their honey, disarming their resentment by a curious squeaking noise it has the power of producing.

In common with many other nocturnal insects, the eyes of the Death's-head Moth shine at night like two stars, which adds considerably to the terror inspired by its appearance.

The HUMMING-BIRD Moth is so called because its appearance when on the wing exactly resembles that of a Humming-bird. It feeds on the wing, as the bird does, hovering before each flower and sucking out the honey by means of its very long proboscis. It is very shy, and darts off if the slightest movement is made; but if the spectator remains perfectly quiet the Moth sees no danger and will continue its meal within a yard of him. The Moth appears to gain confidence if it is not disturbed, and in a few days will become almost tame, permitting the spectator to whom it is accustomed to approach quite closely without appearing alarmed.

The TIGER Moth.—This common but beautiful Moth is found in the beginning of autumn. It runs on the ground with such swiftness as to be often mistaken for a mouse. I have more than once seen a kitten chasing a Tiger Moth among the flowers in a garden, evidently deceived by its resemblance to a mouse. The larva is popularly called "the woolly bear." It is rather large, and is surrounded with tufts of long, elastic hairs of a reddish-brown color, which serve as a defense against many enemies. When disturbed it rolls itself round just like a hedgehog does, and if on a branch suffers itself to fall to the ground, when the long, hairy covering defends it from being injured by the fall. When the caterpillar is about to change into a pupa it spins a kind of hammock, and lies there until it comes forth a Moth.

The color and markings of this Moth vary considerably. The usual tints are, the thorax brown, the body red, striped with black. The two anterior wings are cream-color, marked with bold patches of a deep brown; the posterior wings are bright red, spotted with bluish black.

The MANY-PLUMED Moth is found towards the close of autumn usually running about windows. It is very small, measuring barely half an inch across the wings. The structure of the wings is very curious, each of the two anterior

wings being divided into eight beautiful feather-like rays and each of the posterior into four rays. Nearly allied to this are the common Feather Moths, the most common of which is the White-plumed Moth, whose wings measure nearly an inch across, and are divided into five feathered rays.

All are familiar with the COMMON GNAT. This pretty tormentor passes its larval existence in the water, in which state thousands may be seen in any uncovered water-butt, wriggling about with the most untiring energy, or reposing head downwards, only leaving the end of the tail at the surface. The reason for this is very curious. This larva breathes through its tail, and is, moreover, enabled by means of the fringe of hairs which it possesses to carry air down with it.

It is a singular circumstance that, although the larva lives in the water, yet were either the eggs or the perfect insect to be submerged, they would be destroyed. The instinct of the Gnat in order to fulfil all three conditions is very beautiful. When the Gnat wishes to deposit its eggs, it rests on a leaf or twig on the surface of the water; it then takes each egg separately, and fastens them side by side in such a manner that they actually form a little boat, which will neither fill with water nor upset, however the water may be agitated. In a few days the eggs are hatched, when a little lid opens in the under end of each egg, and down tumbles the larva into the water.

After remaining in the water for some days it assumes the pupa form. In this state it floats at the surface, with the back of the thorax uppermost. Soon this splits and the insect emerges, standing on its own cast skin, which forms a raft for it until its wings are fully dry, when it takes to flight, leaving behind it the empty shell floating on the water. This change may be witnessed any warm day in summer.

The GADFLY has from the most ancient times been known as the terror of the herd. At the sound of its approach the cattle are driven almost mad with terror. The young Gadflies are nourished under the skin, where they remain until they are fit to pass into the pupa state, when they bury



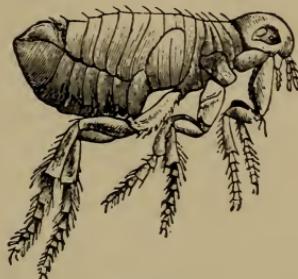
HUMBLE-BEE WITH NEST—STONE HUMBLE-BEE.

themselves in the ground, and after a few days spent under the earth issue forth in their perfect state.

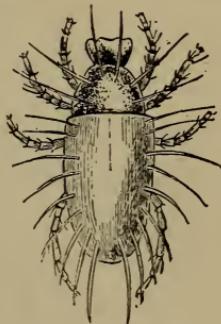
The HUMBLE-BEE FLY is found in the early days of spring, and may be seen hovering over the primroses and other spring flowers. It feeds in the same manner as the Humming-bird Moth, and much resembles that insect in many of its habits.

The FLEA.—The strength and agility of this curious little insect is perfectly wonderful. Many of my readers have doubtless seen the exhibition of the Industrious Flea, who drew little carriages, and carried comparatively heavy weights with the greatest ease. The apparatus with which it extracts the blood of its victims is very curious, and forms a beautiful object under a microscope of low power. Its leap is tremendous in proportion to its size. This property it enjoys in common with many other insects, among which the Common Grasshopper, the Frog-hopper, and the Halticas or Turnip-flies are conspicuous. In all these insects the hinder pair of legs are very long and powerful.

The HARVEST-BUG.—These creatures are mostly minute, requiring the aid of the microscope fully to develop their form, but some are considerably larger, and their organs can be distinguished with the naked eye. In this order are included the common Cheesemite, the Harvest-bug, the Water-mites, etc.



FLEA.

CHEESE-MITE
(much enlarged).

x 932

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